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Editorial

THE VALUE OF MEMBERSHIP IN ORGANIZED MEDICINE. THIS IS APPARENT IN THE OUSTER OF DOCTOR LOUIS E. SCHMIDT FROM CHICAGO MEDICAL SOCIETY

PRICELESS ASSET OF MEMBERSHIP IN CHICAGO MEDICAL SOCIETY AND ILLINOIS STATE MEDICAL SOCIETY IS A PRECIOUS TREASURE ABOVE AND BEYOND THE MANIPULATION OF LAY DICTATION, AND VIOLATORS OF ORGANIZED MEDICINE'S CODE OF ETHICS DISCOVER TO THEIR SORROW THAT "VERILY, THERE ARE THINGS BEYOND PRICE"

That tenacity with which Dr. Louis E. Schmidt strives to regain membership in those reputable medical societies that have ousted him on account of his ethical transgressions, partakes little of the dignified repentance of a skilled scientist, cognizant of the error of his ways, and willing and eager to cry "Mea culpa, mea maxima culpa."

Rather in insolent, defiant determination, would those attempts be characterized as more indicative of the hysteria of a spoiled, self-willed child, suddenly thwarted in its desires.

Lay organizations and individual citizens of wealth and influence invoked to wield the "big stick" impudently over the heads of the ethical medical profession are due for sad and certain shock. Lightly as these "big stickers" may esteem ideals in the abstract, it would seem that eventually they will find that ethics and honor are not commodities to be bought and sold over a counter or dried, salted, and pickled as a prize in the market place.

WHAT PRICE ETHICS?

More than all the billions of big business can bring to bear!

It has been definitely stated that a few in-

fluential commercial lay organizations and individuals have expressed the intention of "forcing" the Chicago Medical society to re-instate Dr. Louis E. Schmidt as a member in good standing.

Announcement of such coercion is interesting from the standpoint that this pronouncement shows exactly how thoroughly this country is under the thumb of bureaucratic control, and how far a certain proportion of lay organizations has progressed along the way of writing prescriptions and making diagnoses in cases of illness. For years this JOURNAL has been warning the medical profession of the status of inferiority bestowed upon it by that group of citizenry whose service is to Mammon rather than to mankind. Action like that intimated in the Schmidt case brings home the argument clearly and sharply. Not only is such attempted coercion a direct violation of the constitution of the United States in point of individual rights, but it is further an illegal attack upon professional group independence.

If an executive of a large industrial corporation should be discharged by the governing board of that organization for a direct violation of one of the ethical rules of that business, would that governing board tolerate for one instant an organized medical society's demand, not request, but demand—for the re-instatement of the individual at fault?

If these lay organizations and wealthy citizens should decide to boycott the medical profession of Chicago and of Illinois because ethical medicine has debarred a man from fraternity and membership because of his infractions of the rules of ethics an extraordinary situation will result. Such action will refuse to the medical societies that privilege of selection accorded any reputable club in the country—of asking for the resignation of a member because he has broken one of the by-laws or rules of the club.

The whole thing is too ridiculous to consider seriously save that so many ridiculous things have a habit of garbing themselves in the habiliments of the respectable and the revered. Some even manage to become laws.

On the face of affairs, common politeness would tend to indicate that what an organization doles out to one of its members, after due deliberation and long and patient counsel, would be a matter between that organization and the member in disgrace. In other words, it does not concern big business, or big business men what any fraternity may do to one of its members unless it be their own club or group. What right, what jurisdiction has any lay organization, or combination of lay organizations over the Chicago Medical society or its affiliated professional group? Exactly the same jurisdiction as either or both of these two medical societies have over the Chicago Association of Commerce's decision as to what color of blinds it will put up in its offices, or as to how much Armour & Company shall pay per pound for beef on the hoof.

Certainly when lay organizations band together to "force" the professional societies who put him out, to take back into their bosom the ethically erring Dr. Louis E. Schmidt, let them pause and look the situation squarely in the face. They will begin to see the light. If Dr. Schmidt wants to make himself ridiculous by further flouting ethical medicine he will continue to encourage such mis-directed partisanship by a portion of the misguided laity to his great disadvantage.

It may be emphasized that not until ethical medicine has passed entirely under the thumb of an egotistical laity will that laity be permitted to utter an ultimatum upon what is or is not ethics in medicine.

THE CHICAGO MEDICAL SOCIETY IS IN NO WAY INTERESTED IN A COMMERICAL ADVERTISING CAMPAIGN

An erroneous impression now floods the lay press to the effect that the Chicago Medical Society is about to enter into a vigorous commercial advertising campaign. This is false as false can be. Dr. Louis E. Schmidt was recently expelled from both the Chicago Medical Society and the Illinois State Medical Society for just such an infraction of the standards and tenets of recognized medical ethics.

An editorial appearing in the Bulletin of the Chicago Medical Society under date of September 21, 1929, through a possible laxity of phrasing so laid itself open to misinterpretation by the laity and subsequently the lay press that to a portion of the general public and even to many of the profession it has appeared that the Society is about to sponsor a commercial ad-

vertising campaign for physicians and surgeons and among the laity, rather than, as it did mean, a campaign of education of ethical medicine among physicians themselves and among the laity.

Unfortunately this unofficial, misleading editorial was hailed by the lay press and by many publicists as the last word on the advertising question and a complete reversal of our medical standards. It has brought to the offices of the A. M. A. and elsewhere a tremendous influx of criticism that at times has bordered upon the inherently vicious. Protests have been both written, printed and verbal.

Let it be stated now, and for all time, that advertising is against medical ethics. The ideals of the Hippocratic oath remain unchanged.

The only advertising in which ethical medicine is interested is that which teaches the general public the ideals, the progress and the skill of ethical medicine. It must be unalterably understood that this advetrising will exploit the science and practice of medicine, and not the individual physician under any circumstances.

Never in the councils of the Chicago Medical Society has the question of commercial advertising ever come up for discussion, because every ethical physician is thoroughly aware that such exploitation would never be countenanced by the body professional even if the physician's own personal ambitions should lead him into such misguided desires.

The editorial mentioned in the Bulletin of the Chicago Medical Society, which has been subjected to such distortion in lay hands, expressed the opinion of one man, who, if the truth be told was probably as much surprised as anybody when he discovered the misinterpretation that had been put upon his remarks by the laity.

Medical journals written from a medical standpoint for medical men are just as prone to misinterpretation by the uninitiated as chemical journals written for chemists would be if they were read by outsiders. The appearance of this editorial in the Bulletin of the Chicago Medical Society in no way stamps it as the official opinion of the Chicago Medical Society or any other medical society either in the state of Illinois or the United States. All over this country, in fact all over the civilized world but one opinion maintains as to the attitude of ethical medicine and advertising. And that opinion is voiced to eternity in the Hippocratic oath.

The whole tempest in a teapot is a warning that under present conditions, doctors today should be very cautious as to what they print or say in public, officially or otherwise. The newspapers of the country are on the alert to pick up any statement that may lend new fire to the Schmidt controversy and reverse the right of medical societies to rule upon the paramount question of what medical ethics is and what ethics is not.

THE ILLINOIS LAW RELATIVE TO THE ABANDONMENT OF BABIES

Any person, firm, or corporation, taking a case of confinement into his or her home must be licensed so to do by the state department of public welfare. (Chapter 23, p. 78, *Cahill.* Illinois Revised Statutes (abstract.)

The superintendent of child welfare of the State department of Public Welfare writes us as follows:

"First: We find that a number of doctors and a greater number of midwives, especially in the smaller towns, as well as in Chicago, are taking care of confinement cases in private maternity homes, which is not in accordance with the provision in the Illinois Statutes. The law requires that any person, firm or corporation, taking a confinement case into his or her home must be licensed so to do by the State Department of Public Welfare. This policy, therefore, is clearly a violation of the law, and many of the abandoned babies are traceable to such conditions.

"Second: Some doctors and many midwives caring for a confinement case of the illegitimate type are making provision for the placement of babies for adoption into foster homes, without making the required reports to the Department of Public Welfare. This, also, is clearly a violation of the law.

"Third: Some doctors and many midwives in order to be relieved from any responsibility accompanying the placement of an illegitimate child in a foster home, or for its possible abandonment, are advising their patients to leave the hospital, or other place of confinement, with their child, making a direct placement and sign-

ing a formal consent. This practice is merely a technicality in the evasion of the law, requiring that all such placements have the approval of the State Department of Public Welfare."

Mr. Battis believes that such practices on the part of some physicians are not intentional evasions of the law, but are made without a knowledge of the laws of Illinois.

It is hoped that every County Medical Society will discuss this matter thoroughly, and have it brought to the attention of every member of the Illinois State Medical Society, so that physicians may fully cooperate with the State Department of Public Welfare, and help it in minimizing the abandonment of babies throughout the State.

For information concerning these conditions, complete details can be received by writing Roy James Battis, Superintendent of Child Welfare, Department of Public Welfare, Room 530, State House, Springfield, Illinois.

PROGRESS OF ACTIVITIES

Educational Committee
Illinois State Medical Society

Many public speakers and writers are advocating that the medical profession educate the people to seek medical advice to prevent disease rather than to cure it. This is not a new thought. The Illinois State Medical Society at its meeting in June, 1922, passed a resolution to the effect that "The House of Delegates goes on record as endorsing a broad plan of education through pamphlets, addresses and the lay press, any or all, to the end that the public be enlightened on the truths and principles contained in the development, progress and present status of medicine."

So the machinery for bringing this desired program into effect was set up; but it was not until 1925 that real activities in health education were begun. The work of the Educational Committee, appointed by the Council, has resulted in a better understanding between certain lay groups and the profession. The public wants to be educated and is using the various means of securing "health" information offered by the Education Committee.

Read what the public thinks about the talks that are being given practically every day of the year by representatives of the Committee:

"It is certainly gratifying to a layman to know what the Medical Profession is trying, with all its might, to accomplish for the human race."—President of a club of young business men.

"A most beneficial and interesting talk most ably given. The Medical Society is doing a wonderful work and should be sincerely complimented."—President of a Woman's Club.

"Allow me to express my appreciation, and the same of the teachers of this county, to you for sending Doctor —— to lecture to our Institute. It was splendid indeed and well received by 350 public school teachers."—A County Superintendent of Schools.

"This lecture was without a doubt, one of the best we have ever had the privilege of hearing."—President of a Parent-Teacher Association.

"We were very well satisfied with the talks and we certainly thank the Illinois State Medical Society for cooperating with the Home Bureau. I am sure the Home Bureau Women have appreciated this opportunity of hearing these doctors."—County Adviser of Home Bureaus.

"The doctor gave a very splendid address. Every person was much interested and would have sat for another period to listen. Address full of common sense and helpful suggestions."—A County Superintendent of Schools.

Fifty health educational talks were given during the month of October by members of the Speakers' Bureau of the Educational Committee, and 6 scientific programs were arranged for County Medical Societies.

Jean McArthur,
Secretary.

DINNER FOR DR. CHARLES B. REED

On October 11, 1929, the Chicago Gynecological Society gave a dinner in honor of Dr. Charles B. Reed, President of the Chicago Medical Society, who for twenty-five years has been treasurer of the former Society. Dr. William McIlwain Thompson, President, presided.

The grace was offered by Rev. Dr. H. R. Anderson of the Fourth Presbyterian Church. Addresses were given by Mr. Payson S. Wild, Secretary of the Chicago Literary Club, Dr. James

H. Hutton, President-Elect of the Chicago Medical Society, and Dr. Irving Cutter, Dean of Northwestern University Medical School, and Dr. Pliny I. Blodgett, President of the Illinois Chapter of the Isaak Walton League. Each speaker paid tribute to the diversified talents of Dr. Reed.

Three Past Presidents of the Chicago Gynecological Society were present: Henry T. Byford, who was also one of its founders, E. J. Doering and Rudolph Holmes.

SECTION ON RADIOLOGY

This section is asking for volunteers for papers on Radiology or some allied subject for the 1930 program. As the time and number of papers are limited, applicants will be considered in the order of their coming as well as the matter and quality of the subject and discussion.

Such communications can be directed to: Dr. I. S. Trostler, chairman, 25 E. Washington St., Chicago, Ill., or to Dr. Henry W. Grote, secretary, Bloomington, Ill.

CONTACT WITH LAY GROUPS MADE BY THE EDUCATIONAL COMMITTEE

The Educational Committee of the Illinois State Medical has had a very satisfactory working agreement with some of the important lay groups of the state. A report of these contacts was published in the Illinois State Medical Journal of July, 1929:

"Your committee has been represented at the organization meetings of the Elks Foundation for Crippled Children and satisfactory plans have been set up for crippled children's clinics. The Foundation has definitely stated that these clinics will be held only in counties where the medical society wishes and that no patients will be admitted to these clinics unless accompanied by the family physician or with his consent.

"The Chicago Woman's Club has been especially interested in promoting an educational campaign concerning cancer. The Committee has been represented at the conferences of the Club and when a definite educational program is launched, the Educational Committee will take an active part in promoting intelligent information about cancer.

"The Committee has been represented on the Advisory Council of the Child Hygiene Division of the State Department of Health. The Council has approved a plan for work in several counties of the state which will require the cooperation of the Medical Society, Dental Society, and certain lay groups. Such a plan of procedure should make for a much better understanding on the part of community groups, relative to certain health problems which may be studied."

Other groups mentioned in this report are the Illinois Federation of Women's Clubs. Hundreds of speakers are sent to the women's clubs over the state. The Chairman of Public Health and Child Welfare of the Federation has worked very closely with the Educational Committee. The Committee cooperated with the Federation in promoting the observance of Health Week and particularly May Day.

The Illinois Congress of Parents and Teachers and the Educational Committee have also worked together during the past few years. The Congress suggested to the local Associations that pre-school children be taken to the family physician for examination and correction of defects. This plan has been worked most successfully and to the entire satisfaction of both parents and physicians.

Cooperation has been given the Chicago Woman's Aid, the Jewish Peoples Institute, the American Public Health Association, the Illinois State Dental Society, The Home Bureau organization of the state, the Farmers Institutes, the Kiwanis Clubs in promoting Boys' Week, the State Department of Health, and the Woman's Auxiliary.

During the month of November many high schools are observing Health Day of American Education Week. Principals from all sections of Illinois are securing speakers from the Educational Committee to give health talks on that day. Similar talks were given to teachers at annual fall institutes.

The South Chicago Y. M. C. A. is giving a series of ten health lectures of interest to the public. Speakers are being furnished by the Educational Committee. Another Chicago Y. M. C. A. has asked aid in securing speakers to give short health talks at noon in *40* large industrial plants of the city.

The Committee has had splendid response from some of the lay-health groups when calls

have been made upon them. Physicians from many different states have called upon the Committee for copies of radio talks, for outlines for popular health talks, and for books of clippings taken from current newspapers and magazines.

Each member of the Educational Committee gives many hours of time to checking over all the press articles before they are released, in making sure that all talks which are broadcast over the radio are suitable for the public and in keeping with the policies of the Illinois State Medical Society. Valuable time is also given in order that representatives of the Committee may meet with representatives of these many lay groups to talk over problems which affect both the medical profession and the public. Hundreds of physicians all over the state are cooperating in every way possible to promote this health education campaign.

JEAN MCARTHUR, *Secretary.*

INFANT AND MATERNAL MORTALITY AND THE SHEPPARD-TOWNER ACT

States that rejected the Sheppard-Towner Act would appear to have had better luck in the reduction of infant and maternal mortality than have those states that submitted to this unfortunate measure. Although mortality rates have been on the decrease over a period of years, yet only 12 out of the entire 48 states had a lowered infant mortality in 1928, and of these twelve states five did not work under the Sheppard-Towner Act.

Illinois can congratulate itself with cold, hard statistics that it refused to countenance the Sheppard-Towner Act. In Illinois, where there is no Sheppard-Towner Act, the maternal mortality rate for 1928 was only 5.1 per thousand. California is the only state ranking anywhere near this figure among those states working under the Sheppard-Towner Act, and in California the climate is a factor not to be disregarded.

Altogether the five states working without the Sheppard-Towner Act, — Connecticut, Illinois, Kansas, Maine and Massachusetts have a much lower mortality rate for maternity and infancy, than have those states working under this nefarious and deceptive legislation.

Under date of June, 1929, the *Quarterly Review of Biology* makes comprehensive comment on the Sheppard-Towner Act. This periodical's published review might well cause "wonder as to whether states co-operating under the Sheppard-Towner Act are being duped, or co-operating as a result of the activities of job-holders or potential job-holders. Based on the report of the United States Department of Labor Children's Bureau for the fiscal year ending June 30, 1927, startling figures are shown. It is noted that the states accepted $4,697,234.86 of Federal funds, which means that the expenditure was in excess of nine millions of dollars as most of the Federal funds are matched dollar by dollar for the states."

Apparently this vast expenditure was no factor in lowering the death rate. Why? Because the Sheppard-Towner Act is not now, never was, nor ever could be a medium for palliating maternity mortality since the inherent nature of this legislation makes it impossible to effect such functioning.

Presenting the argument in figures,—saying it with numbers, as it were—in Illinois, though the improvement took place down state and not in Chicago, infant deaths per thousand live births declined from 64.4 to 64.2. Fatalities among babies less than twelve months of age were reduced from 8,606 as in 1927, to 8,321.

In Chicago there were 1,872 fewer births in 1927 than in 1928 so that the reduction in infant deaths per 1,000 births had an increased prorata of 63.9 in 1928, as against 62.7 in 1927. Downstate infant deaths in 1928 were 4,545 instead of 4,784 as in 1927, so because of this congratulatory difference of 239 the down state infant death rate fell from 65.7 to 64.3.

Illinois maintained its maternal mortality figures of 5.1 per thousand, the same as in 1927. While fewer deaths were registered from childbirth,—694 in all,—yet the unusually low birth rate recorded put these figures at a disadvantage in the computation of statistical tables. Of these 694 deaths in childbirth 322 were out of a total 61,216 births and stillbirths in Chicago, or a rate of 5.1 per 1,000. As there were 73,130 births and stillbirths down state, the 372 maternal deaths lowered the down state rate to slightly more than five per thousand. Further classification of these figures shows that even 66 per cent. of these deaths were preventable, as in 237 or 34 per cent. of all the deaths the cause

is laid to puerperal septicemia, while in 181 other cases, or 26 per cent. acute nephritis was held to be the mortality cause.

Lowered birth rates and increased infant mortality rates came principally from urban districts. Especially is this true of 19 out of 44 cities of more than 10,000 population such as Chicago, Peoria, Cicero, Danville, and Decatur, each with a minimum population of 38,000. Urbana reported no change in rate and twenty-three cities reported declines.

Illinois, remember, has not the Sheppard-Towner Act on its shoulders. Of these twelve out of the forty-eight states experiencing an improvement in the infant mortality rate, were the five, that are not burdened with this invidious legislation,—Illinois, Kansas, Connecticut, Massachusetts and Maine. These lead. Of the other seven, California was the only other state with a large population and working under the Sheppard-Towner act that reported a decrease. Native sons should hold this another guerdon for California sunshine.

Illinois as a state is to be congratulated on its wisdom, rooted in the activities of ethical organized medicine, in keeping invidious medical legislation off the statute books. To this foresight and to that eternal vigilance by which the medical liberty of commissions of health and sanitation has been left to a large degree in the hands of the doctors, lies a large part of the credit for the high rank of Illinois in vital statistical tables.

Along with this fine record on infant mortality and in spite of the fact that birth rates decreased in 34 states and death rates increased in 1928 over 1927, Illinois is on the right side of the fence. Thirty-eight states were included in these figures. When the federal census bureau compiled its basic tables Massachusetts had not yet completed its vital statistics for 1928. Colorado, Georgia, Oklahoma, and South Carolina were not in the registration area in 1927. Utah is also omitted.

Still, including these states, *not a single state in the Union showed a decreased death rate in* 1928 and only Maine and Vermont held to the level of 13.9 for both years. Maine held to its birth rate. There was an increased birth rate in Arizona, Delaware and Montana, and the national death rate that had been 11.4 in 1927 increased in 1928 to 12.1 per 1,000 population. Birth rates that had been 20.7 per 1,000 of population in 1927 fell in 1928 to 19.7.

Oddly enough the Illinois death rate increase of from 11.4 in 1927 to 12.2 in 1928 is practically coincident with that of the national death rate increase.

Commenting further on these statistics is an interesting excerpt from the *Chicago Daily Journal,* of July 22, 1929. This reads:

"The birth rate for Illinois is below the national figure. It fell from 18.3 in 1927 to 17.5 per 1,000 for 1928. Only three states in the registration area had a lower birth rate than Illinois. These were Idaho, 16.6; Oregon, 15.6; Washington, 14.4; with Colorado the same as Illinois or 17.5 per 1,000. Illinois lost standing in relative death rates. In 1927 there were eighteen states which had a lower death rate, while in 1928 there were twenty-two lower than Illinois.

DROP IN INFANT MORTALITY

"Illinois was one of the eleven states which showed a decrease in infant mortality in 1928 for the year. This is an outstanding distinction because the national mortality rate for infants under 1-year of age jumped from 64.6 per 1,000 to 67.9 in 1928, or an increase of 5.1 per cent in a single year, In exact numbers this means that 6,489 infants under 1-year of age died in the registration area in 1928 over and above the number that would have died with the 1927 death rate prevailing.

"The state that reduced infant mortality were:

Name.	1927 rate.	1928 rate.	Decrease per 1,000
Maine	80.0	72.8	7.2
Vermont	69.8	64.9	4.9
North Dakota	63.4	59.2	4.2
Florida	67.4	67.1	0.3
California	62.3	62.1	0.2
Illinois	64.4	64.2	0.2

NO CUT IN CHICAGO RATE

"Illinois is the only state in the registration area with one of the first nine metropolitan cities in its borders which reduced its infant mortality rate in 1928. New York state increased its infant mortality rate 5.1 per 1,000, almost 10 per cent in a single year. Pennsylvania, the next in size, advanced its rate 3.3 per 1,000, an increase of 4.7 per cent. Ohio, next in size to Illinois, increased its rate 5.6 per 1,000, or 9.1 per cent.

SURPASSED BY ONLY THREE CITIES

"Compared to the twelve largest cities in the United States Chicago holds an outstanding position in controlling infant mortality because only Baltimore, Los Angeles and San Francisco have surpassed it. Tabulation shows the relative rank of these cities in infant mortality rates:

City.	1927 rate.	1928 rate.	Increase per 1,000
San Francisco	49.7	45.5	4.2*
Los Angeles	66.3	65.7	0.6*
Baltimore	81.4	81.6	0.2
CHICAGO	62.7	64.0	1.3

Buffalo	72.0	74.1	2.1
Milwaukee	68.0	71.0	3.0
Pittsburgh	72.1	75.2	3.1
New York	56.0	59.3	3.3
Cleveland	56.0	60.1	4.1
St. Louis	57.4	63.8	6.4
Philadelphia	63.9	70.8	6.9
Detroit	70.0	77.4	7.4

*Decrease.

"Not a single one of the eleven largest cities in the United States increased its birth rate or lowered its death rate during 1928. Chicago decreased its birth rate from 19.6 per 1,000 in 1927 to 18.7 in 1928; and increased its death rate from 11.5 per 1,000 in 1927, to 12.5 in 1928.

Vital statistics on infant and maternal mortality during 1925, 1926, 1927, in the five states working without the Sheppard-Towner Act were:

INFANT MORTALITY RATES

	1925	1926	1927	1928
U. S. Registration Area for Birth	71.7	73.3	64.6	67.9
Connecticut	73.3	72.1	58.8	59.0
Illinois	72.5	69.4	64.4	64.2
Kansas	61.7	65.3	55.3	59.2
Maine	76.3	80.0	80.0	72.8
Massachusetts	73.0	73.1	*	*
	71.36	71.98	64.4	63.8
Average 4 to 5 States...	7			

*No Data returned to U. S. Bureau.

MATERNAL MORTALITY PER 1,000 LIVE BIRTHS

	1920	1924	1925	1926
Registration Area	8.0	6.6	6.5	8.1
*Connecticut	6.8	5.7	4.9	5.76
†Illinois	*	6.2	5.8	6.50
Kansas	8.4	6.3	6.5	6.97
Maine	8.5	8.2	7.2	6.69
*Massachusetts	9.3	6.5	6.3	6.42
Average States	8.25	6.58	6.14	6.47"

*Not in Registration Area for Births.
†Latest Available Figures.

As the *Quarterly Review of Biology* so aptly says:

"That eight millions of dollars spent for the Sheppard-Towner Act seems to us like a lot of money. What have we got for it, outside of creating some pleasant places for jobholders?

"Examining tables it is found that during the year ended June 3, 1927, there were held a total of 33,783 conferences at which 29,041 mothers and expectant mothers and 227,733 children were registered, inspected, advised and instructed. In the same period there were also conducted 1,196 classes in which 26,356 mothers were enrolled, etc.; a total of 18,207 talks and lectures, including 110 radio broadcasts, were given to 408 physicians, 794 nurses, 13,442 laymen, and the uncounted millions of the radio audience; 46,217 sets of prenatal letters were sent out; and that the total of 'pieces of literature distributed' was 4,403,218."

"The jobholders have not been idle. In the section, "Some Results of Five Years of Work," under the heading "Reduction in Infant Mortality," a table gives the average infant mortality rates by states for the years 1917-1921 (exclusive of 1918) and 1922-1926—before and after the act took effect. By this we are able to compare the course of affairs in the co-operating states with those not co-operating. No averages are given in the table, but it is easy to compute them; which was done by Dr. G. Henry Mundt with the result here given:

	1917-21 (1918 omitted)	Infant mortality 1922-26	Per cent. decrease
16 co-operating states	80.07	71.56	10.6
5 non-co-operating states	84.96	73.18	13.9

These figures are simply flat averages of the rates given in the table. Weighing them by the population of the states, and omitting certain states which either did not come into the Birth Registration Area until 1919 or which did not begin co-operating until 1923, neither this nor any other treatment of the figures has altered the conclusion that eight million dollars of the taxpayers' money has been spent with precisely no effect at all on the course of infant mortality.

"People all over the country are commencing to question more and more the feasibility of bureaucratic government which is becoming all too prevalent. This analysis of the operation of the Sheppard-Towner Act is just one more link demonstrating the impracticability of Federal Bureaucracy," says Dr. Mundt.

All the figures cited in this article go to prove that the Sheppard-Towner Act lives up to the Editor's contention from the outset in 1921 of this proposed legislation that as a medical aide-de-camp, the Sheppard-Towner Act is most efficacious when it is non-existent.

HOW TO KILL YOUR MEDICAL SOCIETY

1. Don't come to the meetings.
2. But if you do come, come late.
3. If you do attend a meeting, find fault with the work of the officers and other members.
4. Never accept an office, as it is easier to criticize than to do things.
5. Nevertheless, get sore if you are not appointed on a committee; but if you are, do not attend committee meetings.
6. If asked by the chairman to give your opinion regarding some important matter, tell him you have nothing to say. After the meeting tell everyone how things ought to be done.
7. Do nothing more than is absolutely necessary, but when other members roll up their sleeves and willingly and unselfishly use their ability to help matters along, howl that the organization is run by a clique.
8. Hold back your dues as long as possible; or don't pay at all.
9. Don't bother about getting new members. Let George do it.—ILLINOIS MEDICAL JOURNAL, February, 1922.

SAVING FOR A KIDDIE KAR

The real optimist, tho, is the Kansan who went to New York for a monkey-gland operation to restore his youth, and bought only a one-way ticket so he could get the benefit of a child's fare ticket on the return trip.

Original Articles

THE DIAGNOSTIC RELATIONS BETWEEN THE GALL BLADDER AND THE HEART*

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There seems to be conclusive evidence that a definite relation exists between certain cases of gall bladder disease and heart disease. Surgeons occasionally use the phrase "cholecystic heart" with the idea that the gall bladder pathology bears a casual relation to the heart condition and symptoms. Graham recently accented this relation when he wrote, "We have observed brilliant results in cases of heart disease following cholecystectomy after it had been determined that there was a pathological gall bladder. We know of suspected cases of angina pectoris receiving complete and permanent relief following cholecystectomy after it had been determined that there was a pathological gall bladder." Babcock, in 1909, reported thirteen cases as evidence that chronic cholecystitits is a cause of myocardial failure. Lichty wrote well on the same subject. This paper apparently made very little impression though Willius recently wrote, "We at the Mayo Clinic have seen the striking improvement that so frequently occurs in the cardio-vascular condition following operation."

Acute cholecystitis seems to have less disturbing influence as a rule on the cardio-vascular system. However, the great pain incident to a paroxysm of biliary colic seems more definitely to upset the circulation. Osler, Krehl, Sticker and Reisman have noted disturbances of the heart during such paroxysms of biliary colic and Allbutt recorded a case of an otherwise healthy young women who died suddenly during an attack of colic. At necropsy a stone was found in the common duct but the heart and body otherwise were normal. Willius reports a series of sixty-one cases of chronic cholecystitis which were complicated by cardio-vascular disease. Of these, following operation, 54 per cent. showed definite improvement in their cardio-vascular condition, 16 per cent. were unchanged and 7 per cent. were worse. Abram and Weitzand have reported similar cases.

*Oration on Medicine at 79th Annual Meeting of Illinois State Medical Society, Peoria, May 21-23, 1929.

The presence of gall stones is probably to be regarded as a by-product and an end result of inflammation or disease of the gall bladder. Cholecystitis does not include cholelithiasis, but the latter usually intimates the former. Whether inflammation is the sole element or even the chief element in influencing the heart and just how much part stones may play, are factors difficult to separate and evaluate. The gall bladder is not an organ to be medically or surgically despised. While not much good may come of it, certainly much evil may proceed from it, though one author recently referred to it as "a relatively unimportant appendage." When diseased, it rarely lives unto itself alone. Sudler showed the intimate lymphatic connection between the gall bladder and the liver through the attachment of the gall bladder to its liver bed. Graham next confirmed Sudler's experiments and showed that in every case of cholecystitis a hepatitis was present in the interlobular sheaths as a cholangitis. When secondary to a cholecystitis, the right lobe was more involved than the left, and the right lobe near the gall bladder most of all. The hematogenous route may be the common one for infection of the gall bladder, but it may be of lymphatic origin secondary to a hepatitis.

Many problems arise here that center around a rather simple question: How does a diseased gall bladder affect the heart? Here is a hollow pouch, blind at one end, holding 30 c. c. of bile, having apparently the two functions of storing and of concentrating bile, usually full in the early morning, emptying by its own contraction, fed by a branch of the right hepatic artery, drained by the cystic vein which empties into the portal vein, innervated by sympathetic ganglia and fibers and apparently by medullated fibres from the left vagus, which if diseased and when removed in certain cases, relieves or improves a heart failure or perhaps dramatically cures angina pectoris. One abnormal gall bladder may be associated with signs of failure, another with angina, and another with no heart disturbance. Why do a few hearts seem drawn into the cardio-vascular picture and others not at all? A healthy heart may stand a severe infection or a reflex vagal inhibition easily or recover from such influences quickly, whereas a heart muscle may be seriously damaged to the

point of actual failure of variable degree. Sufficient studies have not been made to determine whether the bile acids play any part or whether splanchnic disturbance either vascular or nervous, or both, has an influence.

Kahn and Barsky discuss the relation of gall bladder disease to angina pectoris and state that the relation "requires careful clinical consideration." The common link between gall bladder disease and angina pectoris is pain,—and pain from either may localize in the epigastric region, or higher up, substernally, precordially or down the left arm. Certainly, as these authorities state, the diagnosis of both diseases may be made when symptoms pointing to both conditions are present. But cases occur, as will be illustrated later in Cases No. 4 and No. 5, when the pain and the symptom alone point to angina pectoris but the subsequent developments showed what was thought to be angina pectoris and what probably was angina pectoris, to be a symptom of cholelithiasis and cholecystitis. The error, heretofore, in these cases, the chief point in this discussion, and the real reason for this paper, is that the diagnosis is made of angina pectoris and the patient considered to have only angina pectoris, whereas the angina pectoris is but a symptom related to and caused by a chronic cholecystitis.

Case No. 2 illustrates that one may have apparently an angina pectoris of effort and yet the disease was apparently caused by a cholecystitis and that without stones. Certainly what was called angina pectoris was cured by cholecystectomy. However, one must remember the point made by Kahn and Barsky—that cholecystitis and angina pectoris may be associated with definite symptoms of both. It is not here to be intimated that when such an association exists that a cholecystectomy will relieve every case of angina pectoris.

Surgeons are only indirectly interested in heart disease and the tables of symptoms of cholecystitis are usually constructed by them. It is natural that as a rule any study of the relations between the gall bladder and the heart should come from internists. We have been in the throes of the doctine of focal infection, which however valuable, has its limitations but perhaps also has relations not thoroughly studied. One authority states that "the causal relation of foci of chronic infection to heart disease is not proven." This is preceded by the statement that "any acute infection may aggravate the existing cardiac disease and at times may actually cause it." Willius sums the matter by saying: "A chronic focus of infection may not be the immediate cause of trouble elsewhere, yet it is shown repeatedly that the progress of a disease is enhanced by such a focus." One has only to think of a diphtheria or a typhus fever to realize the result of an acute infection on the heart. It is not difficult to realize that chronic infection in the gall bladder may damage the heart, particularly when cholecystitis is chiefly a disease of middle and old age at the period when hypertension, arteriosclerosis, valvular disease, hypertrophy and obesity are most frequent and the heart may already be impaired, or do too much work for the age.

Acute cholecystitis averaged only 7.6 per cent. out of 848 cases of disease of the gall bladder, whereas chronic cholecystitis is "one of the most frequent ailments of adult humanity." In one series of 1,650 patients gastric symptoms from chronic cholecystitis were three times more frequent than from appendicitis, twice as frequent as from duodenal ulcer, twelve times as frequent as from gastric ulcer and six times as frequent as from gastric carcinoma. Eusterman concludes "that 60 per cent. more cases with gastric symptoms are associated with a distended gall bladder than with a peptic ulcer." The abnormal gall bladder, which comes under the term "cholecystitis," is usually an inflammatory process. The strawberry gall bladder may be an exception to this. Approximately 55 per cent. of cases of chronic cholecystitis are associated with stones. The incidence in women is twice to three times as frequent as in men. Of the autopsies at the Mayo clinic more than 60 per cent. have shown gall bladder pathology. In suspected cholecystitis jaundice is of value and is usually associated with stones but the absence of jaundice is no evidence against a chronic cholecystitis.

In chronic choleystitis advanced heart failure is rare but a first degree heart failure is common. To delay operation on the gall bladder and yet keep the patient in bed is really treating the circulation and increasing the cardiac reserve. It is, however, in cases of choleystitis associated with angina pectoris that apparently greater

diagnostic surprises occur and clinical cures as well. It is probably wise for internal medicine to enlarge its conception of angina pectoris. We have tried to find *the one cause* of angina pectoris, but there is probably no more one cause of angina pectoris than there is one cause of meningitis. Levy has just accented the necessity for enlarging our conception of angina pectoris and speaks of it as the "symptomatic manifestations of many pathological states." We have thought of heart disease at different periods in such different terms and in such varying points of view. In the time of Senac, Corvisart and Burns we thought in terms of enlargement and dilatation and dropsy; in the time of Withering, in terms of dropsy and digitalis and just a little of heart strength; in the time of Laennec chiefly in terms of murmurs, and then not until in the time of MacKenzie did we apparently begin to accent heart disease in terms of muscle and muscle strength and muscle failure, as it deserves to be. Lewis and MacKenzie and Wenckeback explained the arrhythmias, but probably not even yet do we think of heart disease adequately in the larger accents of its etiological criteria.

For example, we know much more about angina clinically than we do etiologically. To enlarge our conception of angina is to consider it not only a pain but rather a painful manifestation of a greatly varied pathology. In certain cases it seems to be a symptomatic manifestation of an abnormal gall bladder. Into this pathology, as a cause, the gall bladder should be considered and with the addition of cholecystography we have a method of investigation. In an adult repeated angina pectoris in the absence of certain etiology should suggest the consideration and investigation of the gall bladder with cholecystography unless, of course, the gall bladder symptoms are so pronounced that more careful investigation is unnecessary. We are not sure at any rate of the difference between cardiac pain of varying degree and this pain that we call angina pectoris. Levy includes, under clinical condition with which cardiac pain may be associated, such a variety of pathological states as affections of the coronary arteries, affections of the aorta, cardiac valvular disease, pericarditis, disorders of the hematopoietic system, endocrine disorders, cardiac neuroses, and pathogenesis undetermined.

The intimation that the abnormal gall bladder may cause heart failure or may be the cause of a suspected angina pectoris without apparent cause, may persuade one not only to investigate the gall bladder but to prepare the patient carefully for operation with the idea that a cholecystitis may be a two-edged sword which constitutes the pathology and causes the heart symptoms. Occasionally deep palpation of an abnormal gall bladder will cause a reflected pain to rise obliquely to the precordium with or without reflection to the shoulder, and down the left arm. In a woman of 45 with general complaints of nervousness, weakness and abdominal discomfort, particularly gas after meals, deep thumb palpation of the gall bladder immediately caused a pain to appear under the lower third of the sternum, over the precordium and in the left shoulder. It was reflected in almost a straight line to these three points. Cholecystography confirmed a suspected abnormal gall bladder. Operation revealed a chronic cholecystitis with two large stones. Occasionally there is substernal radiation. A diagnostic relation between the diseased gall bladder and certain cases of angina pectoris that justifies the name "gall bladder angina" is illustrated by the following cases:

1. W. A. B., a man, aged 69, was admitted to the hospital May 16, 1927. He had complained for two years of attacks of substernal pains extending across the chest at the nipple level and involving the upper epigastrium. The attacks came when he was worried and tired. There was no radiation of pain to the arms or shoulders. The pain at times was tight to grinding, vomiting occurred and a hypodermic was required. Past history was negative except for typhoid at twelve and an attack of acute, painless jaundice at 30. There was a one plus dilatation of the aorta, heart sounds clear and blood pressure normal. A diagnosis of angina pectoris had been made for the past two years. A week before coming to the hospital he had become jaundiced, but the day after entering the hospital he had a severe vice-like attack of substernal pain requiring a grain of morphia for relief. Temperature rose to 100.4 degrees and pulse to 100. Apparently this was an attack of gall bladder colic with pain in the chest under the mid sternum. Operation was done four days later and a small, fibrous gall bladder was found which contained a stone. A cholecystectomy was done. There has been an excellent recovery and no further pain in the chest. Operation was done by Doctor Dan C.

Elkins, who states in his notes: "This is the first case of gall stone colic I have ever seen so closely simulating angina. I do not believe the diagnosis would have been correct unless this patient had become jaundiced."

2. W. H. C., a physician, aged 57. This patient underwent a cholecystostomy in 1916 previous to which time he had been suffering with jaundice. In November, 1928, after hunting, he ate a large dinner and then drove two hundred miles. The next day there was an attack of severe pain which began in the epigastrium, proceeded substernally to the precordium, down the left shoulder and left arm. Pain lasted seventeen hours and morphia did not relieve. Since that time he has had variable attacks—one in the right upper quadrant, another substernal and precordial and down the left arm. In January he had a severe attack, which he considered to be angina pectoris, substernal, precordial and to left arm, and thirty minutes later an attack of severe pain in the right upper quadrant. A cholecystectomy was done March 29, 1929. There were no marked adhesions and the rather small gall bladder showed a mild cholecystitis. There were no stones. Blood pressure has been normal throughout. There was no shortness of breath and all pains have disappeared. The patient considered himself well. There have been no more attacks.

3. J. M. F., aged 55, had been complaining of angina pectoris for a year. His condition had gradually grown worse. Past history negative. Angina pectoris was substernal, precordial to the left shoulder and down to the tips of the fingers. It appeared with worry, excitement, strain, over-eating, and particularly with exercise. The attacks were so easily produced that one would develop if he walked a block from his residence to the office and the substernal pain would appear after rising from his chair and sweeping the hearth with a small broom. A diagnosis was made of angina pectoris probably dependent upon coronary sclerosis. He entered the hospital on January 12 and that night had a most severe attack in the right upper quadrant which was not relieved by morphia. He slept all day the thirteenth and the fourteenth had a second similar attack in the right upper quadrant. He requested operation and cholecystectomy revealed a strawberry gall bladder. There were no stones. The pain has disappeared, though uphill or upstairs gives slight shortness of breath.

4. L. L. B., aged 59, a civil engineer. Past history negative. He complained of shortness of breath for six months and precordial pain for four years. There have been several very severe attacks which radiated to the left shoulder and down the left arm with pallor, shortness of breath and fear of death. He had complained previously of numbness in the ring and little fingers of the left hand. A diagnosis had been made of aortitis with dilatation of the aorta. Hypodermics were necessary for relief of the pain. Blood pressure and heart sounds were normal. Peripheral vessels were one plus thickened. There was very slight tenderness on deep pressure over the gall bladder. Impression was of angina pectoris third degree, heart failure first degree, and arterio-sclerosis. While under observation he suffered an attack of indigestion which he attributed to food, then became jaundiced and a diagnosis of cholecystitis was made. Operation revealed a chronic cholecystitis with a large number of stones. Recovery was uneventful, shortness of breath and thoracic pain disappeared and he feels well. He can hunt all day.

5. L. F., aged 48, had suffered for two years with several attacks of mild precordial pain, reflected to left shoulder, down the left arm and always relieved by nitroglycerin. She was nauseated and nervous at times. Always there was an uneasy feeling about her heart during attacks, though no pallor. She was admitted to the hospital in July, 1928, and remained for three weeks under a diagnosis of angina pectoris and obesity. In January, 1929, she had an acute attack, like gall stone colic under the right costal margin; jaundice quickly followed and a marked tenderness over the gall bladder developed. There were twelve attacks in one month. Cholecystectomy was done, pericystic adhesions were present and the gall bladder thickened—a typical chronic cholecystitis with two stones.

CONCLUSIONS

1. The patient with a diseased gall bladder previous to any symptoms characteristic of cholecystitis, with or without a choleliathiasis, may present symptoms of early heart failure or angina pectoris, or both.

2. In middle and old age heart failure or angina pectoris may be produced or accented by a diseased gall bladder.

3. In both conditions the gall bladder may be the cause, but all the signs and symptoms may appear cardiovascular in nature.

4. It is suggested that cholecystography may be of great aid in distinguishing between an angina pectoris dependent upon a gall bladder pathology and an angina pectoris dependent upon other pathology.

5. Such patients, provided they be in fair condition and *well prepared* for operation, should not be deprived of the benefits of surgery. They apparently stand operation better than their clinical condition might indicate.

NOTE: I am indebted to my colleagues at the Emory University Hospital, Dr. C. W. Strickler and Dr. Dan C. Elkin, for opportunity to study some of their cases. Their assistancs has been invaluable in the preparation of this paper. I am also indebted to my asso-

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PERIODIC HEALTH EXAMINATIONS*

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The subject of periodic health examinations or health audits is one which has given rise to much discussion during the past few years, and many articles have appeared in current literature dealing with its various phases. It is quite remarkable the great similarity that is to be found in these articles. Nearly all of them discuss the great advantages that the authors believe will accrue to those examined, and then follows usually a treatise on how such examinations should be conducted. As is quite common in similar cases, much of the matter consists of quotations from previous articles, or of opinions passed on from one to another, with very few new facts presented on which the opinions are based. The opinion that increased longevity has resulted from these periodic examinations is not based on evidence that has been analyzed in a manner to satisfy scientific criteria. One or two insurance companies claim that the mortality rate in a small number of their policyholders, who have had health examinations made, was less during a comparatively short period than was to be expected from their mortality tables. There was no evidence presented, however, indicating what, if any, pathologic conditions were found at these examinations, nor if such conditions were found, whether or not anything was done to relieve or remedy them. The mere fact that a health examination had been made is no proof that the slightly lower mortality rate bore any relation to the examination. There is scientific evidence of a definite downward trend in the mortality rates during the past few years which must be taken into account in the evaluation of any health measure at this time. Even though it could be clearly shown that periodic health examinations would result in a lowering of the mortality rate, or that it would promote longevity, it would still remain to be shown that such diminished mortality rate, or such increased longevity was of material advantage save to life insurance companies that are interested primarily in the number of premiums paid by its policyholders. The number of such premiums is increased naturally by anything that will prolong life. The value of periodic health examinations cannot be based, therefore, on the mere fact that longevity may be increased as shown by life insurance mortality rates. To justify the medical profession in urging periodic health audits on the people, it must be clearly demonstrated that such examinations not alone tend to prolong the life of the individual, but that they also add to his health and happiness and usefulness to others. These latter benefits must greatly outweigh the former, since a life prolonged in ill health and suffering and but a care to others, is of very doubtful benefit.

The most important phase of the subject then is, the value of a health examination, or health audit to the patient. The term "patient" is used to include those presumably in good health, as well as those having some definite ailment. We may eliminate from our discussion at this time any value which these examinations may

*Read at Annual Meeting of the Illinois State Medical Society at Peoria, General Session, May 21, 1929.

have to life insurance companies in the prolongation of the life of their policyholders. If these examinations do not lead to better health, happiness, and usefulness to the patient, then it were better that they be discontinued. We shall try to analyze the subject with this point in view. It is claimed by the proponents of the practice, and I may say that practically all who have written on this subject are in this class, that the human machine, like any mechanical device that generates or transforms energy, must be kept in good repair if it is to operate at its maximum efficiency. A very fascinating analogy is drawn between a locomotive, an automobile, a fine watch, etc., and the human machine. It is pointed out how essential it is to keep a machine in good repair, to keep it well oiled and free from dust and dirt, to prevent too much wear and tear in order that its life may be prolonged, and its efficiency maintained. This analogy so beautifully drawn is not well chosen, since there is a vast difference between a mechanical device and a living organism which seems to have been overlooked, and that is, that the latter or the living organism possesses the power of self adjustment, or the ability to make its own repairs. This power to adjust internal to external relations resides in the living organism itself, and is not comparable to the repairing of a machine by man, hence, much of the glamour of the analogy is lost—it is a fictitious or deceptive beauty. This power of making its own repairs while self contained is also limited —limited in degree as well as time.

It is these facts that have led so many physicians to urge strongly the need of a periodic examination in the hope that any deviation from the normal may be detected before it has reached a stage that is beyond repair. It is evident, therefore, that the claim that a physical examination of an apparently healthy individual is beneficial must rest on two assumptions: first, that it is possible to recognize the incipient stages or deviations from the normal at a time when repair or a return to normal is still possible, and second, that it is possible by proper treatment or by regulation of one's habits to bring about the result desired. It requires a much more thorough physical examination and a more careful and intimate study of one's personal habits, his mode of living, his hereditary tendencies, etc., if one would attempt to advise an apparently well person, than is often necessary in the presence of a definite and well-defined pathologic condition. It is not alone sufficient to detect gross pathologic lesions. The purpose of these examinations is to recognize pre-pathologic conditions, if I may be permitted to use such an expression, and the only index of such conditions is function. Every organ is capable of performing more work than is required under ordinary circumstances and often long before physical changes are recognizable as such, deviations from the normal are to be detected only by diminution in the amount, or an alteration in the quality, of the work done. This involves the determination of the degree or quality of function present, and since that is often not practicable or even possible we are frequently compelled to fall back on the patient's sensations as a guide to early pathologic conditions.

Here are three facts that present themselves for consideration: one, physical changes may occur without giving rise to abnormal sensations under ordinary conditions; two, highly sensitive or nervous persons may mislead by greatly exaggerating or even imagining sensations; three, sluggish or stoic persons, wishing to deceive themselves, may overlook or deny the presence of sensations which actually exist. In order to recognize and correctly interpret these various states often requires an intimate knowledge of the person's temperament, of his disposition, of his tendencies, of his business and social relations in life. To be able to do this, one should have a good knowledge of psychology at least to the extent of being able to recognize his patient's mental attitude, his susceptibility to suggestion, the effect that worry over his physical condition may have on his general health and happiness. These things are often of the greatest importance to the welfare of the person who comes for a health audit. These facts also emphasize the importance, if not the necessity, of having health audits made by the person's family physician, by one who is intimately acquainted with the individual. They also show the absurdity of having such an examination made by a representative of some lay corporation organized for profit with a home office located often a thousand miles away. When insurance companies began recommending to their policyholders to have a periodic

examination, with the idea of increasing longevity, certain commercial organizations sprang up for the purpose of making these examinations and thus securing some of the financial gain which might accrue to the insurance companies by reason of the increased number of premiums paid, provided it could be shown that life might be prolonged somewhat as the result of these examinations. Since the physician is the only person competent to make these examinations these commercial institutions can prosper only by securing a large number of physicians throughout the country to whom policyholders and others may be sent to have an examination made. The person examined in such cases is usually a stranger to the physician who makes it. The latter fills out a blank form and sends the report to the home office of the institution. For this examination and report the physician is paid by the institution $3.50 or $5.00. The physician making the examination is not supposed to give the examined any advice, nor even to tell him anything about the conditions found. The home office, after reading over the examiner's report, writes to the examined, telling him of the conditions found and advising him what to do for them, for which advice a charge of from $20.00 to $25.00 is made. In plain words, the physician who makes the examination sells his knowledge and brains to an institution for $3.50 or $5.00, and the institution re-sells the same to the person examined at a profit of from 300 to 400 per cent. What great clairvoyant or second-sight powers these advisers at the home office must have! What manner of amplifiers have these jobbers in medicine by which the value of an examination and report made by a physician is amplified from $3.50 or $5.00 to $15.00 or $25.00! Is a person at a distance better able to advise one as to his physical condition than is the physician who has talked with him, who has made a careful physical examination of him, and who is familiar with his characteristics, his tendencies, his family traits, and his economic situation? The proposition is so absurd that it would seem that the ordinary layman would fail to be impressed by it. We may excuse the layman on account of his thoughtlessness in matters of this kind, but how can we excuse the doctor who permits the products of his brain to be sold to a jobber who resells it to the consumer at a profit of from 400 to 500 per cent? Should not common business acumen restrain him from falling a victim to the sophistry of these institutions? Periodic health examinations are not a matter of altruism, nor are they an act of charity, but they are purely a business proposition; however, on this basis it is the duty of the physician to see that the patient gets value received for the consultation fee paid. Many persons apply for an examination with an earnest desire to know what their physicial condition is. It will not do to put them off with an evasive answer, or with a simple remark that they are all right, or with a haphazard examination. One must listen attentively to what the person has to say, he must bring out all the symptoms and sensations which he may have and analyze them carefully in order to properly evaluate them, and after this has been done a complete physical examination should be made with the usual laboratory tests. In other words, if a health audit is to be made, let it be a complete one. For some years the medical profession has been urging people to have these health audits made. The advice has been given earnestly and seriously and entirely with the idea of benefiting the individual. The reasons why this advice should be followed have been clearly set forth repeatedly. People are proverbially procrastinators, and even when symptoms or other evidence of an existing pathologic condition are present they are prone to delay consulting a physician. There is nothing more disheartening to a physician than to be consulted by a patient who by carelessness and neglect has permitted a curable condition to become incurable. It is this perhaps more than anything else that has led the profession to continually urge people to be examined. It may seem at times that it may have been too insistent on apparently well people submitting themselves to periodic examinations, but if so, it is due simply to the earnest desire to stimulate in everyone a greater appreciation of good health, which so easily lost is often difficult to regain. Perhaps too much enthusiasm may have been displayed in this connection, and too much stress laid on the importance of well persons being examined. Of course no one will attempt to deny the necessity of everyone who experiences

any evidence of a disorder consulting a physician at once, but there are those who believe that the matter may be overdone in regard to the well person, and that harm even may result to some individuals by an injudicious examination, particularly if the report of the findings is given to the examined. Logan Glendenning in his work on "The Human Body" says, "There are all over this country now institutions whose sole business it is to make routine physical examinations on supposedly healthy persons once or twice a year. There is growing up a strong wave of opinion in favor of this plan, and among the most enthusiastic adherents of it are the members of my own profession. From that opinion I most strongly dissent. If I am asked: 'What, don't you believe that a person should be examined once a year?' My reply is quite simple—'No, I do not.' I have seen the plan in operation and I have seen practically nothing result but grief and unhappiness. The number of people who supposed themselves well and who were symptomless, and who found on examination a condition of disease which could be materially remedied—the number of people whose lives were lengthened—was so small as entirely to be minimized in the face of the dead load of meaningless sorrow entailed. What usually happens is this: most of the patrons of such a system are men; most of them have considerable financial responsibility, and most people who have considerable financial responsibility are no longer young. Therefore a middle-aged man is the usual victim. In the great majority of cases if such men have anything to be found wrong with them, it is a slight defect of the heart, some kidney change, and a beginning of hardening of the arteries, or hypertension. There is 'a splintering of the Q R S wave in the electrocardiogram, an accentuated aortic, a pressure of 170 over 95, a faint trace of albumin, and an increase in the blood uric acid.' This report is handed to a man who believes he is in good health. He looks up things in an encyclopedia or medical book and decides he has received his death-sentence. He goes on a diet to reduce his uric acid, is denied whiskey, gin, tobacco, and venery, in fact everything which might lighten the gloom. Not one of his abstentions changes the tissues of his body. If he had not had the examination, he might have lived twenty-five years without a symptom. He has been turned from a happy, self-contented member of society into a morose, apprehensive hypochondriac. This scene has become so frequent a drama that in my own circles there is a phrase for it—'one of those damnfool health extension cases.'"

There is much truth in this statement. However, the fault lies not in the mere fact that the person has had a physical examination, but in the lack of good judgment on the part of the physician making it. How often do we have patients come into the office bearing a report from some institution that makes periodic urinalyses, or periodic health examinations, calling the patient's attention to some apparent abnormality in the urine, or in the blood pressure, or in the pulse rate, etc., which may be of no significance in itself, but which has unnecessarily greatly frightened the patient and caused him needless apprehensions about his health. Much harm may be done in this way to those who are of a nervous disposition or easily affected by suggestion, by permitting them to read reports which they are unable to interpret, or by thoughtless statements made by the examining physician, which only excite their fears and make them unhappy. Whenever such a person gets it into his mind either by what has been unintentionally said, or written, that he has something the matter with him it is often almost impossible by any amount of arguments to convince him that what was trivial and of no importance was not really of serious import. Great judgment and care are required, therefore, in making disclosures to such patients in order not to cause needless mental distress. For this reason these examinations should be made by the family physician, or by one who is thoroughly familiar with the individual's temperament, and not by an impersonal institution at a distance.

I have had recently two cases illustrating the harm that may result from a report from an institution at a distance on the condition of the persons examined. One was a case of a young man who was engaged and about to be married. He came to me in great perturbation of mind and showed me the report which he had received.

In the report it was stated among other things

that his heart was affected and that he was syphilitic. You may imagine the state of mind of a young man about to get married after reading that report. Neither in his history nor in the physical examination was there the slightest suspicion of his having had syphilis, and repeated Wassermanns were negative. Careful examinations and tests of his heart functions failed to show anything abnormal.

The second case was that of a middle aged man of great business responsibilities, who was informed in his report that he had Bright's Disease. Naturally he was greatly disturbed in his mind, since if it were true it necessitated material changes in his affairs.

He was examined, therefore, by two or three very competent physicians, who observed him for some time, making repeated tests and who failed to find any evidence whatsoever of disease of the kidney.

These cases demonstrate how important it is that these examinations should be made by one's family physician who can observe the patient when necessary, and how inadvisable it is to make injudicious statements. This does not mean in any sense that an individual should be kept in ignorance of the presence of a definite pathologic lesion which may be benefited or relieved by proper advice or treatment. There are instances however, when it is inadvisable to make known to the patient the presence of an abnormal condition which is giving rise to no disturbance whatsoever and for which nothing can, or should be, done to correct. For instance, if one discovers that a person has a simple endocardial murmur which is unknown to him, and which is causing no symptoms whatsoever, and for which nothing can be done, it is very doubtful if the patient should be acquainted with the fact as it will but unnecessarily add to his worry and distress of mind. Likewise the discovery of a movable kidney, so common in women, which is causing no trouble or distress, should not be told to the patient since many women when told that they have a movable kidney almost immediately develop imaginary symptoms which are very difficult to overcome. In the presence of a definite condition which cannot be remedied, in a man of middle age, who is in active business, it is a great mistake to make him give up his business and everything else that has contributed to his pleasure in life and thus make him miserable and unhappy with the idea perhaps of prolonging his existence for a short time.

During the last quarter of a century from ten to twelve years have been added to the average expectancy of life. This statement which is often made is usually misunderstood. It does not mean that ten years have been added to the expectancy of life at all ages, but simply that ten years have been added to the average expectancy which is very different indeed. This increase in the average expectancy of life is due almost entirely to a greatly diminished mortality rate during the first few years of life so that a much larger proportion of individuals live to adult age. In fact there has been practically no increase in life expectancy of those fifty years of age or over.

The significance of this is that if we hope to accomplish anything by our health examinations in the increase of life's expectancy it must be by the examination and care of the young.

Some most astonishing facts have been brought to light by Dr. Kegel, Health Commissioner of Chicago, in the examination of school children. Under Dr. Kegel's supervision 156,000 Chicago school children between 6 and 14 years of age were carefully examined by a number of selected physicians. Of this number 134,000 or 85% were found to have a total of 412,453 defects, classified as follows:

Malnutrition and Anemia	25,137
Enlarged Lymph glands	71,549
Enlarged thyroid	13,260
Nervous diseases	2,157
Cardiac disease	3,314
Defect of speech	3,014
Suspect tuberculosis	2,404
Other pulmonary diseases	5,927
Skin disease	8,337
Rickets	13,827
Other orthopedic defects	4,477
Defect of vision	29,902
Other diseases of the eye	8,150
Defect of hearing	3,087
Discharging ear	2,076
Defect of Nasal breathing	15,315
Defect of teeth and palate	105,722
Hypertrophied tonsils	61,763
Adenoids	32,205
Mentality	880
Grand Total	412,453

This is found to be an average of 3+ defects to every child. In 111,000 children or 71% of those examined the defects were of such a degree as to require correction. If they are permitted to go uncorrected they are certain to be the cause of much morbidity and a greatly increased

mortality over those who are free from such defects.

From these facts it is very evident that if periodic health examinations are to accomplish great good they must be begun early in life when the defects that are discovered are still remedial and the regenerative and recuperative powers of the body are at their highest state of efficiency.

It is the duty of all family doctors to bring these facts to the attention of parents and to impress on them not only the importance of having their children examined at intervals but also the necessity of having the correctable defects that are discovered promptly remedied.

CONCLUSIONS

1. Periodic health examinations in order to accomplish the greatest good must be begun early in life.

2. The family physician who is familiar with the collateral facts relating to the patient is the one who should make the examination.

3. The one who makes the examination is the one most competent to give advice to the patient.

4. In examining adults the physician should be most judicious in what he communicates to the patient regarding his findings lest he do more harm than good.

5. The chief purpose of these examinations is to add to the health and happiness of the examined.

6. The principal advantage of these examinations is the opportunity which they afford the physician to educate the people in correct methods of living.

7. It has not yet been definitely established that periodic health examinations promote longevity.

CORONARY DISEASE*

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It is with some timidity that I approach the discussion of my subject this afternoon before your Association, because I am aware that a member of your Society has probably contributed more to our knowledge of coronary disease than any other one man in this country. I refer to Dr. J. B. Herrick of Chicago.

We are hearing more and more at the present time concerning the increasing incidence of heart disease as a cause of death, and when one examines the statistics for the past twenty-five years covering the registration area of America, one is impressed by the fact that the mounting incidence of heart deaths affects individuals beyond forty years of age. We point with pride to the improvement that has been made in living conditions and to the longer span of years that people enjoy at the present time, but a critical examination of the data shows that we have done little toward increasing the life expectancy of individuals who attain the age of forty. Children born today have an expectancy of 55 to 57 years, but the present day adult of forty can look forward to living little longer than his progenitors of two hundred years ago.

Standing on the threshhold as a barrier to longevity we have the group of so-called degenerative diseases of which arteriosclerosis, coronary disease, apoplexy and hypertension are examples. Our knowledge of the cause of human arteriosclerosis is, as you know, very deficient. In spite of a large amount of work on the subject we know little more fundamentally than did Lobstein nearly one hundred years ago, who first introduced the term arteriosclerosis to designate a thickening and hardening of the arteries. Therefore, with our knowledge so meager it behooves us to be cautious in drawing conclusions as to the factors underlying the vascular deterioration that we call arteriosclerosis.

Statistics show that at present the most common cause of heart death in individuals beyond forty is hypertensive heart failure. This was found in a series of more than one thousand autopsied cases of heart disease seen at the Cleveland City Hospital during the past ten years. A second important cause of heart death in adult life is coronary disease. The coronary arteries like other arteries in the body are frequently the seat of arteriosclerotic changes. The vessel wall is thickened and hardened and the lumen is more or less narrowed. The delicate intima normally in contact with the blood becomes roughened, with more or less calcification and fibrosis. This scarring of the intima

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is probably an important factor in spontaneous thrombosis since fresh coronary thrombi are most frequently found, at autopsy, in that part of the vessel showing the most extensive intimal disease.

When one observes a large number of cases of coronary disease at post mortem, one is struck by the fact that there is no parallelism between the extent of the coronary arteriosclerosis and the clinical signs of heart failure. There are more patients with advanced coronary changes that were clinically silent than there are those whose coronary disease was apprehended clinically and so diagnosed. At one extreme we see sudden death from coronary thrombosis in a man who regards himself in his customary health, and at the other advanced coronary disease that caused no symptoms. Between these two extremes we have a number of very difficult clinical problems so far as accurate diagnosis is concerned, namely, those individuals who develop more or less insidiously symptoms of breathlessness on exertion. Examined at this stage, one may be at a loss to explain the respiratory distress on the basis of heart disease. There may be no demonstrable cardiac enlargement, no evidence of valve disease, and no hypertension. Following such patients, however, over a period of months, one observes clear signs of myocardial insufficiency, i. e., edema, pulsus alternans, gallop rhythm, cardiac dilatation, etc. The clinical picture is that of progressive myocardial failure, but in the absence of the better known factors leading to heart failure the diagnosis is often an inferential one. At autopsy in such instances one may find extensive coronary arteriosclerosis with diffuse fibrosis of the ventricular muscle.

In order to explain the variety of clinical pictures that one sees in patients with coronary disease, it is necessary to mention a few points pertaining to the anatomy and physiology of the coronary circulation. The two coronary arteries spring from the very root of the aorta, in the Sinuses of Valsalva, and are distributed directly to the heart muscle. The left coronary artery supplies primarily the left ventricle and also part of the anterior wall of the right ventricle, while the right coronary supplies primarily the right ventricle, but also part of the posterior wall of the left ventricle. For many years physiologists and anatomists debated as to whether the coronaries were end-arteries, but we now know that there may be an elaborate anastomotic communication between the branches of the two vessels. Observations on a large series of injected human hearts show that there is a certain relationship between age and coronary anastomosis; with advancing years the collateral circulation becomes more elaborate, which suggests that a man of sixty is better prepared to compensate for a coronary lesion than one of forty. This is borne out by clinical experience. For example, one is reminded of the serious prognosis in individuals in the early forties who have angina pectoris as a manifestation of coronary disease, whereas patients developing angina beyond fifty may, by limiting their activities, live for many years. Besides age as a factor in coronary anastomosis, we have another important factor, namely, the suddenness with which the vessel is occluded. An acute interruption of the blood supply through the main stem of one coronary artery may cause acute circulatory collapse and often sudden death, whereas the same lesion developing gradually is accompanied by no symptoms. For example, syphilitic changes at the root of the aorta commonly lead to narrowing or to complete obliteration of the mouths of the coronaries, but the occluding process is a gradual one and no signs of myocardial infarction appear. As Oberhelman and Le Count have shown in such cases, an elaborate capillary anastomosis is developed between the two coronary arteries which is usually adequate to prevent infarction of the heart muscle. Still another important factor influencing compensation in coronary disease is the Thebesian system of vessels, those tiny channels which communicate directly with the heart chambers. The true significance of these vessels was demonstrated by Wearn of Boston, who in an ingenious set of experiments showed a direct communication between the coronary arteries and the chambers of the heart through the Thebesian vessels. As Wearn mentions, the best evidence that the Thebesian vessels actually take over the function of the coronary arteries is supplied by obervations on patients with complete obliteration of both coronary arteries by syphilis. I have seen three such instances. Syphilitic occlusion of the coronaries is a slow process in most cases, so that ample

time is afforded for the development of collateral circulation. Other illustrations of the adaptation of the organism to disturbances in physiology might be cited. For example the lung air in a typical case of chronic pulmonary emphysema shows a concentration of carbon-dioxide which if suddenly introduced in a normal individual would cause profound discomfort, while the emphysema patient at rest may be quite comfortable and be exchanging little more air per minute than a normal individual.

From what has been said, it is apparent that the functional significance of coronary arteriosclerosis will depend to a large extent upon the capacity of the heart to compensate for the lesion. This in turn depends on the collateral circulation that may be present at the time or that may develop subsequent to the coronary lesion. Extensive anastomosis between the two coronaries and the Thebesian vessels may develop provided the one important factor, the element of time, is present. Besides the time element, we have such factors as 1. The caliber of the occluded vessel—the larger the artery the greater will be the area of myocardium deprived of blood supply. 2. The extent of anastomosis between the two coronaries existing at the time of the occlusion, and 3. The condition of the heart muscle. A myocardium damaged from rheumatic infection or previous coronary disease, or one partially exhausted from prolonged hypertension is less likely to tolerate a coronary accident than a relatively sound muscle.

Such are some of the known factors to be evaluated in cases of coronary disease. It is not remarkable, therefore, that the clinical picture should vary in different patients, or that advanced coronary disease should be found at autopsy in individuals who had, during life, no signs of heart disease.

Coronary Thrombosis. No attempt is made in this paper to give a detailed account of coronary thrombosis. Only the more conspicuous features of the subject are discussed, that they may be contrasted with the more chronic type of coronary disease; the type that may appear insidiously with symptoms of progressive myocardial failure, which continues over a period of months or even years.

When a man beyond forty and in his usual health is seized with a severe attack of substernal pain, which is accompanied by shock, circulatory collapse and dyspnea, we may assume that something definite has happened in the heart. If the patient dies in a few minutes, we may be reasonably sure that he has had a circulatory accident—most likely coronary thrombosis. Indeed, more than 90 per cent. of all individuals dying suddenly, that is, within five to ten minutes from the time they considered themselves in their customary health, will show at autopsy a cardiac lesion, coronary disease and thrombosis, or rupture of the heart at the site of an old or recent infarct. In a few cases a ruptured aorta is found. Very rarely does cerebral hemorrhage kill in a few minutes. In spite of these well established facts, we still find such erroneous diagnoses as "acute indigestion" or "ptomaine poisoning" given as the cause of sudden death.

The fatal circulatory collapse in coronary thrombosis probably is due to ventricular fibrillation from sudden ischemia of the heart muscle. Such cases are of little clinical interest, as they are usually dead when seen by the physician. I have seen a few instances in which an accurate diagnosis was important from a medico-legal standpoint. For example, a workman fell from a ladder, sustaining a slight injury to the scalp. It was maintained that the fall was the direct cause of death, whereas the autopsy showed a recent thrombosis of the main stem of the right coronary artery. In another instance of coronary thrombosis of the left vessel, the patient collapsed while ascending a stair and in falling injured his head. An insurance company with whom he carried a large accident policy contested the claim on the basis that death was due to heart disease, which was proved to be the case by the post mortem findings.

Sudden Onset with Anginal Pain and Circulatory Collapse. Under this heading come the majority of cases of coronary thrombosis that survive the initial attack. The patient, usually a male beyond forty, is seized with an acute pain in the chest, more frequently under the sternum. In more than half the cases the pain is not definitely precipitated by exertion but appears during sleep or while the patient is resting after a meal. Shortly after the onset one is impressed by the signs of shock and circulatory collapse; ashen cyanosis, cold perspiration, rapid, thready pulse, low blood pressure, feeble heart sounds

and some degree of dyspnea. This picture, particularly when the pain is referred to the upper abdomen, suggests an acute surgical condition. The cardiac mechanism frequently remains normal, although irregularities due to extra systoles or auricular fibrillation are sometimes seen. Moisture at the lung bases and a swollen tender liver are common as early signs of congestive heart failure.

Clinical Course. This varies widely. The patient may not recover from shock and die within an hour or two after the attack. He may rally temporarily and then die suddenly. In some instances the signs of congestion with edema and hydrothorax may gradually increase over a period of days or weeks and death result from progressive circulatory failure.

Surviving 24 to 36 hours, the subject usually has a moderate elevation in temperature (99-103F.) for several days, accompanied by leucocytosis. During this period a pericardial friction rub may be heard for a few hours only, in some cases; in others, it persists for several days. If the signs of marked congestive failure do not appear the patient usually has a slow convalescence with a return of the blood pressure to or near normal, the heart sounds improve, and a careful physical examination may reveal nothing unusual. However, the electrocardiograms, both at this stage and as early as a few hours after the initial seizure, may give indisputable evidence of coronary accident.

After the diagnosis of coronary thrombosis is established the therapeutic indications are clear. Excluding embolic accidents from the dislodgement of intracardiac thrombi, the patient's future depends on the healing of the infarcted area in the heart wall. This requires time, and at least a month of absolute rest in bed is imperative. To relinquish this rule may be attended by serious circumstances. For example, I saw a physician a few minutes after the onset of a typical attack of coronary thrombosis which required a grain of morphin hypodermically to control the initial pain. He recovered from shock and after ten days of absolute rest in bed he appeared quite normal. In spite of the fact that he understood the gravity of the situation, on the eleventh day he walked a few steps to the bathroom and fell over dead. Had he remained in bed he might have recovered.

To illustrate the more important features of chronic coronary disease the clinical and pathological findings of the following two cases may be cited. In Case 1 the coronary arteries showed the usual changes of simple arteriosclerosis with calcification. Case 2 is an example of the unusual picture of extensive fibrosis of the vessel wall without calcification.

Case 1. The patient, G. M., a white male, aged 45, occupied as a salesman, was admitted to the Cleveland City Hospital, April, 1926, complaining of breathlessness, dropsy and pain in the abdomen. He was in good health until November, 1925, when he first noticed undue shortness of breath on exertion. This gradually increased, edema of the feet appeared, which progressed until his admission to the hospital, when he was waterlogged and very uncomfortable from dyspnea.

Family history: The only item of interest is that his father died suddenly at 45 of what was called "acute indigestion." He had four brothers and three sisters living and well.

Past history: The patient has been singularly free of infections, and always able to work since he can remember. He gives no history of rheumatic infections or syphilis. He is married and has three healthy children.

Physical examination: Shows a well developed man in great respiratory distress. There is an apparent diminution in vital capacity which actually measures 1400 c.c. The left chest is flat to percussion as high as the clavicle and there is also dullness at the right base. The heart is not enlarged and there is no abnormal precordial activity. Heart sounds are diminished but no murmurs are audible. Cardiac mechanism is normal. The pulse is small volume, and the B.P. is 140/80. There is marked edema of both lower extremities and over the sacrum. The urine contains a heavy trace of albumin and granular casts. There is no anemia and the blood Wassermann is negative. Blood urea is 43 mgs. per 100 c.c.

After a month's rest in bed and repeated thoracenteses, the patient gradually recovered to the point of getting about. He left the hospital against advice and was out only a few days when he returned in the same condition as on the previous admission. After two months he gradually improved and was again able to be up. On July 29 he left the hospital and was not seen until December 19, when he was again admitted with all the signs of advanced heart failure. Death occurred February 15, 1927, or 15 months after the onset of symptoms.

Autopsy findings: The heart in situ appeared normal in size and position. On opening the pericardium there was noted an aneurysmal bulging of the left ventricular wall, about the size of a hen's egg, in the region of the apex. To palpation this area seemed thin and suggested at once a weakness in the heart wall. The heart empty of blood weighed 300 grams. The endocardium was smooth and glistening except over

the interventricular septum and the apex of the left ventricle where it was a dull gray color. The heart valves were free of disease. On the posterior wall of the left ventricle and involving the septum there was an area 5 cm. in diameter, which was entirely fibrosed. Patchy areas of fibrosis were scattered throughout the muscle of both ventricles, and in the region of the apex the muscle was entirely replaced by fibrous tissue.

The left coronary artery about 2 cm. from the mouth was stony hard for a distance of 3 cm. with complete obliteration of the lumen. No fresh thrombus was seen. The right coronary artery was markedly calcified and a fresh thrombus completely obstructing the lumen was found 2 cm. from the mouth.

The aorta showed extensive arteriosclerotic changes but no signs of syphilis. There was a bilateral hydrothorax and ascites with marked chronic passive congestion of all the organs.

Case No. 2. A male, colored, aged 38, and occupied as a waiter, was admitted to the Cleveland City Hospital March 2, 1926, complaining of shortness of breath and "stomach trouble."

Past history: There was a vague history of a chancre about ten years ago, also at about the same time he had what was called yellow fever. Since then he has not been ill.

Present illness: This dates from October, 1925, or five months before admission, but he continued at work until February, 1926, when he was forced to give up on account of breathlessness. At no time had he noticed precordial pain.

Physical examination: Resting in bed the patient was comfortable, but the slightest exertion caused definite respiratory distress. The heart was normal in size and configuration under the fluoroscope. The lungs showed no congestion and the vital capacity was 4600 c.c. No edema was demonstrable. The heart sounds were diminished in intensity but no murmurs were audible. The pulse was small in volume and the systolic blood pressure was between 90 and 100 mm. Hg. on several occasions. There was no fever or anemia, the urine was normal, and the blood Wassermann was anti-complimentary. The electrocardiogram showed inverted T-waves in leads two and three.

With moderate doses of digitalis and bed rest for two weeks, the patient was able to get about comfortably, but the heart sounds did not change and the blood pressure remained low. He was discharged March 23 to report to the outpatient department. Throughout the summer of 1926 he gradually failed and in August edema of the ankles and moisture at the lung bases appeared. When re-admitted to the hospital the heart was definitely enlarged both to the right and left, and a loud blowing systolic murmur was heart at the apex. Cheyne-Stokes breathing was present most of the time. In spite of treatment, the signs of congestive heart failure increased. The precordial activity and heart sounds grew feebler, a gallop rhythm appeared, the systolic blood pressure fell to 80 mm. and toward the end the patient became very dropsical. In this condition he died November 2, 1926, thirteen months after the onset of symptoms.

Autopsy findings: The heart weighed 500 grams. All chambers showed moderate dilatation. The cardiac valves were not diseased and the aorta was smooth with slight intimal sclerosis but no evidence of syphilis. Almost the whole anterior wall of the left ventricle was fibrous tissue, which from the endocardial surface appeared as a pearly white mass. Throughout the remainder of the left ventricular muscle there were patchy areas of fibrosis. The left coronary artery was thickened throughout its course. About 2.5 cm. from the mouth and for a distance of 1.5 cm. the artery felt like a fibrous cord. Section through this area showed the lumen so reduced that it would not admit a fine probe. It was, however, passable for a horse-hair. The intima everywhere was smooth and no calcium deposits were present. It was apparent that the obstruction in this case was due to the uniform thickening of the wall, which had simply encroached upon the lumen of the vessel.

The right coronary showed the same sclerotic changes but not as marked, so that the lumen of the vessel was not appreciably reduced. Apart from the chronic passive congestion, the other organs showed nothing unusual.

The above cases illustrate several important points which may be emphasized here. The first symptoms of coronary disease may be those of impaired myocardial function, such as shortness of breath on exertion. Later, more obvious signs of heart disease appear, as edema, congestion of the lungs, etc. This picture developing more or less insidiously in a patient in the forties may be difficult to explain, particularly, if there is no hypertension and the patient previously has enjoyed good health. That the heart is failing is clear—but why? The usual answer is chronic myocarditis and this diagnosis is made, although clinically it explains nothing and should, as Cabot says, be dropped from our diagnostic terminology. It is unfortunate that the term "chronic myocarditis" carries with it the implication that chronic infection elsewhere in the body is responsible for the myocardial damage. This view is held by many physicians in spite of the fact that there is, so far as I know, no experimental or clinical evidence to substantiate it. Certainly in patients suffering from coronary disease efforts to eliminate focal infection often lead to needless and indeed harmful operations. True, the removal of teeth, tonsils, etc., may be indicated, but that such procedures will

influence the progress of coronary disease is a far-fetched assumption.

SUMMARY

Coronary arteriosclerosis, impairing the blood supply to the heart muscle, is a common cause of death, particularly in males beyond forty years of age. The character of the clinical picture associated with the coronary disease varies widely and depends to a large extent upon the development of collateral channels in the heart, a process which requires time. Thus a sudden block of the coronary artery as happens in thrombosis may be instantly fatal, whereas a gradual occlusion may cause no symptoms.

The clinical and post mortem findings in two cases are given to illustrate the fact that coronary disease may give the clinical picture of slowly progressive myocardial insufficiency over a period of months.

Cleveland City Hospital.

DISCUSSION

Dr. I. F. Harter, Stronghurst: I was very much interested in the discussion of this subject, and I should have been pleased to have heard the doctor's discusion on treatment to a greater extent than what he gave.

I have a patient, a man forty-eight years of age. I was called to attend him one morning about four months ago and found him in circulatory collapse with an enlarged heart, very irregular, and every two or three minutes he would lose consciousness. I was very much alarmed about his condition and expected at least heart failure at any time.

In a few hours he began to revive and continued to improve. I kept him in bed for two or three weeks; he was a man of a highly nervous temperament, business man by occupation, and I could not keep him in bed any longer. He said he must get back to his business.

Wassermann test was negative. X-ray films of the teeth disclosed two impacted third molars, one of which was producing some absorption of one of the roots of the molar in front, and we have been unable to decide in his case what was the cause of his coronary trouble. I should like to have the opinion of Dr. Scott.

Dr. Charles Wiley, Chicago: The startling thing to me from the standpoint of Dr. Scott's cases is that in his early coronary thrombosis he gets this beautiful picture with the T-wave coming off the R spike halfway down, and in these other two cases this Negro and the white man, his electrocardiograph was absolutely negative.

I will say this, that in coronary disease, from an observation covering autopsy records and electrocardiography, the electrocardiograph is a positive finding in about seventy-five to eighty per cent. of these cases. The unfortunate condition is, and perhaps it is all we can expect, the electrocardiograph we get is usually the one which the doctor showed last. That is, a T-wave slurring down below the lead line in lead one and two and above the lead line in the third lead.

These are the cases that you can definitely diagnose as chronic fibrosis, or chronic coronary disease. I think, if anything is certainly significant, it is the electro-cardiograph on these coronary cases.

Dr. R. O. Stites, Industry: I am not sufficiently accomplished to discuss this paper from a scientific standpoint. But I have in mind a subject on which we are going to be investigated because we are not doing something for these hearts. If a person becomes ill with suspect pneumonia, I personally am unable to make a sure diagnosis for at least 72 hours. I am forced by the Public Health Department to report all pneumonia in 12 hours. If I have a suspect pneumonia die suddenly before establishing a diagnosis sometimes I have to call it myocarditis or else face a fine from the Public Health Department. I think a lot of our heart disease increase is because we are forced to give a false report on our death certificates. When your practice extends over nine townships like mine does, with nine different places to report reportable diseases and those of the family who are ill do not know the clerk of the township, and if they do know his name they do not know his address, how are we to comply with the Department of Health requirements? I personally think that our heart disease increase is due slightly to better diagnosis, but mostly due to the fact as mentioned. It is sad that it is so, but facts are facts.

Dr. R. W. Scott, Cleveland, Ohio: The question that the first discussant puts involves the whole subject of the cause of human arteriosclerosis. This, as I indicated in my paper, is an unsolved problem at the present time. That arteriosclerotic changes in blood vessels are associated with age—the wear and tear of living—and that they may be influenced by heredity—are conclusions which have received wide acceptance. Further speculation in the light of our present knowledge is admittedly hazardous. But one question which seems to me to be worthy of consideration is this: May not the fact that more people are reaching adult years today than ever before—the arteriosclerotic age, so to speak—have an important bearing on the increasing incidence of death from arterial disease?

My remarks concerning the electrocardiograms in the two patients whose histories I presented in brief were apparently ambiguous. The records were not normal but they were not sufficiently characteristic of coronary disease to be of any value in the ante mortem diagnosis.

In reply to the question asked by the doctor concerning his patient's clinical picture, I will say that I

hesitate to speculate on what may be the cause of the difficulty. As you all know, no matter how carefully one may study heart cases clinically, there is a certain number in whom a correct ante mortem diagnosis is not made.

THE SURGICAL MANAGEMENT OF LESIONS PECULIAR TO DIABETES MELLITUS*

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The problems confronting the surgeon in the treatment of a patient suffering from diabetes mellitus together with infection or another surgical disease always involves the consideration of three disease processes. First of all are the changes characteristic of diabetes mellitus as a chronic disease; secondly is the presence of acid intoxications, commonly called acidosis; and thirdly is the acute disease, or pathological condition which the surgeon is asked to take care of. If we examine these three components we find that there are two acute rapidly moving processes for which there are specific therapeutic measures, namely, the acid intoxication and the acute surgical condition. The first group of changes are chronic and permanent and are of immediate importance only in that they tell us that this patient has arteriosclerosis with the marked fatty changes characteristic in the lipemia of diabetes mellitus, and with the group of organic changes that frequently occur concomitantly with arteriosclerosis, namely, heart, kidney, and cerebral disease. Bearing these chronic changes in mind as a background, we proceed to solve the two acute transitory conditions.

The discovery of insulin has swung the attitude of the surgeon towards diabetes from pessimism to optimism, and as is usually the case in new medical discoveries the pendulum has swung too far and too much attention and dependence is placed on the new discovery. In addition to the proper use of insulin in the case of a surgical condition in diabetes we feel that there are other refinements of treatment that are important to bear in mind so as not to rely only on insulin and forget some of the fundamental pathology and physiology that determine surgical judgment.

*Read before the Section on Surgery, Illinois State Medical Society, Peoria, May 21, 1929.

Publications by various clinics and clinicians assert that the discovery of insulin has made surgical procedures in diabetics as safe as in non-diabetics. Judd and Wilder[1] state that "no patient has been refused necessary surgical procedures because of diabetes;" but add "It is still possible that diabetes contributes to death in ways that we now have no means of measuring." Foster gives a reduction of from 40 to 12 per cent. in diabetic infections.

We do not, therefore, wish to disregard the fact that insulin, by controlling acid intoxication, is an important adjunct in reducing the operative mortality in diabetics. In pre-insulin days every diabetic case needing surgical intervention was in great danger of developing diabetic coma, whereas, we see today few fatalities after operation in which diabetic coma is the factor in causing death.

The writer's reaction on being asked to treat a patient surgically is as follows: First, the patient because of his chronic diabetes probably has arteriosclerosis, associated with marked fatty changes in the lining of the arteries, and because of such changes is predisposed to what the surgeon fears, the development of thrombosis and embolism. Inasmuch as we do not have specific measures to combat the predisposing cause, we must trust to Providence. In determining the changes due to diabetes there are probably chronic alterations in the myocardium and kidneys and if such are found we can delegate the problem to the internist who can determine the operative risk.

The second problem that presents itself is the state of the acid base balance. This is important because it is apparent that when the acid base balance is upset in a diabetic that that patient has more susceptibility to infection. N. B. Foster[2] states that if surgery is performed on a patient with a blood sugar higher than 350 and a CO_2 combining power lower than 35 volumes per cent. that the operative procedure ends in a sepsis. Some have it that the high blood sugar is the important predisposing element to infection, but it is reasonable to suppose that the mechanism involved is more complicated. We know that the normal defense mechanisms are reacting leucocytes, fixed tissue cells, an intact mechanism for the production of antibodies and the ability of the body to produce a maximum degree of hyperemia. It is very prob-

able that in the presence of acid intoxication that the efficiency of the total defense mechanism is reduced.

It has sometimes been stated that acidosis in diabetes develops as the result of surgical interference. The writer pictures the diabetic as a person who already is in a state of chronic acid intoxication or one whose defense mechanism against intoxication has been depleted to a large extent and therefore it might be said that he is in a latent state of acid intoxication. Also each new disease which attacks such a patient brings him closer to a state of manifest acid intoxication even before the surgeon sees him.

This view explains the susceptibility of the diabetic to infection. Whatever the cause may be the surgeon knows that the important thing is to ask the internist to adjust the acid base balance as best he can.

Infections in a diabetic decrease sugar tolerance necessitating larger doses of insulin. In some infections insulin seems to become inactive. We recall a patient at the Cook County Hospital who received 300 units in 24 hours with no abatement of the infection nor reduction of the acidosis and hyperglycemia. Some consider that insulin becomes inactive in the presence of sepsis. This question is speculative, since besides the marked reduction in sugar tolerance it is possible that a diabetic may terminate with an overwhelming infection as even a non-diabetic does.

Having referred to above changes in diabetes, namely, the permanent pathological changes in the viscera and arteries, the arteriosclerosis, degenerations, tendency to infections, deficient reaction to infection and a greater susceptibility to thrombosis and embolism, we can state the surgical problems of the diabetic.

The internist should manage the medical side of the case. In the case of emergency the surgeon should know that the index of the CO_2 combining power of the blood measures the degree of acid intoxication and should also know the sugar concentration of the blood to know how freely insulin can be used. The surgeon knowing these two measurements can then safely determine the dose of insulin and the necessity for supplying carbohydrates.

Where such is not practicably determined by urine examination he can combat the acidosis by burning known sugar with insulin using preferably 1 unit of insulin to 2 gm. of sugar, giving orange juice which is 10 per cent. sugar or glucose in proctoclysis.

Any surgical procedure which may produce acidosis must be scrutinized by the surgeon. These are 1. the anesthetic, 2. hemorrhage, 3. shock, 4. vomiting, 5. dehydration, 6. starvation, 7. disturbed renal function, 8. infection, and 9. psychic disturbance. We will discuss these under the caption of 1. The Anesthetic, 2. Technique. 3, Post-Operative, and later refer to a short discussion of diabetic infections and lesions of the lower extremity.

The Anesthetic.[8] Any inhalation anesthetic may produce acidosis by anoxemia, or acapnia. This includes ether, chloroform, nitrous oxide and ethylene.

Ether and chloroform also produce acidosis by direct action on renal function and being liquid solvents by inhibiting sugar and fat metabolism. Of the inhalation anesthetics ethylene[3, 4, 5] is the best, producing very slight changes in the liver and kidney, and if given with oxygen so as to prevent anoxemia, is ideal. For abdominal surgery it does not afford sufficient relaxation and since we cannot use the cautery in disposing of cut nerves we object to it in leg amputations.

Local anesthetic formerly was our ideal and the writer went so far as to perform twelve thigh amputations by blocking the sciatics, obturator, and other nerves to the thigh. We find, however, that local anesthesia requires morphin and in thigh amputations also hyoscin and we find by investigation that these so greatly alter renal function (hyoscin also producing organic changes) that we have gradually become less enthusiastic in the use of local anesthesia in diabetics and have entirely discarded the use of hyoscin.

Spinal anesthesia with the recent development in its control is a new anesthetic and its safety as compared to other anesthetics is still in question. The writer having used it in over 100 major operative procedures, including gastric resection, gall bladder work, appendicitis, considers that this anesthetic is especially indicated in diabetes, in any operation under the diaphragm. When used in abdominal surgery it has the following advantage: 1. perfect relaxation,

2. reduces retraction and trauma, 3. reduces the spread of infection by peristaltic gut in acute appendicitis. The disadvantage aside from its questionable safety is the circulatory depression. I have had such in upper abdominal work with the heavy solution but in using spinocaine for appendectomies, intestinal obstructions and thigh amputations we have avoided this handicap. In using spinal anesthesia in diabetics I never use hyoscin and only a dose of morphin sulphate gr. 1/6. The acidosis of diabetes inhibits the perception of pain and this serves in discarding opiates. Spinal anesthesia in our experience is the ideal narcosis for diabetic surgery because it does not affect carbohydrate and fat metabolism and because it allows surgery to be done with a minimum amount of trauma.

Technique—Post Operative Treatment. It is needless to say that respect for tissue should be employed in all operations. I will reaffirm the remarks of all writers on this subject that trauma produces shock, shock acidosis, and acidosis coma. The surgeon's problem in post-operative treatment is to aid the internist by controlling the acidosis. As in other post-operative procedures the surgeon must combat dehydration by the use of fluids per mouth, per rectum or by hypodermoclysis; by control of vomiting, using gastric lavage following laparotomies Post-operatively the diabetic should have about 70 to 80 grams of sugar per day, given preferably per mouth, but if impossible, by proctoclysis of 10 per cent. glucose.

We determine in emergencies the post-operative dosage of insulin by frequent urine analysis regarding acetone and diacetic as the index for more carbohydrate combustion by means of insulin. In many of our cases we have given over 100 to 150 units per day until the internist came to our aid. Milk and orange juice have been our greatest aids post-operatively until the patient could take more solid food.

Diabetic Infections. Pyogenic infection is characterized by the destruction of tissue by the toxin of bacteria and by the reaction of the body to their destruction. In the normal individual active hyperemia and suppuration characterize pyogenic infection and suppuration is the result of the reaction of the body to infection. In the diabetic the reaction of the body is slight and therefore the predominating characteristic of the inflamed regions is necrosis. I do not refer to circulatory occlusion with dry gangrene but to abscess, carbuncles and fascial plane infections to which the diabetic is often heir. This characteristic, together with the fact that patients with acid intoxication suffer less pain than normal individuals, makes the diagnosis of the extent and nature of the infection difficult. No surgeon desires to incise an acute lymphangitis, and still above factors make matters difficult. In our work at the Cook County Hospital we have usually been deceived in the opposite direction by finding under a visible redness and fluctuating area a still deeper and more extensive necrosis and suppuration of fascia, tendon and bone.

In dealing with suppurative processes in a diabetic, whether a carbuncle or an appendicitis, we see no reason for delaying surgical interference. Infections in diabetics require promptness and the patient should not be allowed to develop an extensive infection or sepsis in order to combat the acidosis. Both can be taken care of simultaneously.

At this point we must mention the difficulty in sometimes differentiating an acute surgical abdomen from impending coma. Knowing that such is often difficult the surgeon must exactly weigh the degree of acidosis, CO_2 combining power, blood sugar against leucocytes, abdominal rigidity and in some cases be aided by rectal examination.

Lesions of Lower Extremities. The lower extremities present lesions which compose one of the greatest problems in diabetic surgery because of the presence of arteriosclerosis and lipemia. Because of the impairment of the defense mechanism against infection the diabetic is subject to various lesions, especially in the feet, varying from ordinary infection with good localization to a condition of gangrene or even to a combination of infection and gangrene. By having a conception of the pathology of diabetes there is no necessity in a classification since the determination of treatment will depend on our previous clinical experience with these conditions, and by accurate tests of the circulation in any given case.

Prophylaxis of these lesions include many hygienic measures such as careful paring of the nails, avoidance of trauma from shoes, the early

treatment of ringworm infections of the toes, and even the care of the vessels by means of Buerger's exercises.

In every case in which an infection or in which circulatory disturbances have occurred a study of the circulation of the limb must be made. McKittrick and Root[6] truthfully state that the foot with localized pus or osteomyelitis in the absence of gangrene is a foot with fairly satisfactory circulation, otherwise localization of the infection would not have taken place. We find, however, that the diagnosis of localized infection is deceptive and that frequently there is a process of extension, non-localization and even gangrene under an apparently localized collection of pus. If a study of the circulation be made the additional information will often determine whether or whether not to amputate.

Diabetic gangrene itself has been called arteriosclerotic gangrene. This is partly true but the additional conception must be held that although the arteriosclerosis process is predominant, that the lipemic condition of the diabetic adds to the picture a condition in which there are additional degenerative changes of a more marked degree in the lining of the vessel so that perhaps diabetic gangrenes are accompanied more often by thrombi and rapid extension of thrombosis.

Given any lesion of the lower extremity in diabetes the question arises whether or whether not to amputate. Our experience in this matter is based on about 85 diabetic gangrene amputations and on observing clinically the course of a number in which we did not amputate.

There are certain types of gangrene which do better without amputation than with. If the gangrene is dry, shows a good defense reaction at the line of demarcation and there is present no sign of infection and if the patient is well along in years, shows evidence of heart and renal disease, our experience has been that with careful care of the gangrene the patient's life will probably be longer than if the chance is taken to amputate. If, however, the patient is only in the early fifties and the lesion is early, showing, however, occlusion of the three vessels of the leg up to the popliteal space, an amputation can be more safely advised.

Although the vessels may be occluded to the popliteal space there is always the possibility of development of compensatory collateral circulation and this point is to be considered in the question of amputation, especially in the first type of case mentioned above. If at any time infection is added to a gangrene or the gangrene is accompanied with infection or the infection shows no localization, amputation is advised and in these cases preferably at the knee or above, unless we feel assured by our tests that the circulation is good or that the infection has not extended above the upper third of the leg.

There are various methods to determine the permeability of the vessels. 1. Physical examination. Determine the popliteal when the patient is lying on the abdomen and the leg is slightly flexed. The posterior tibial can be palpated behind the internal malleolus and the dorsalis pedis can be palpated laterally alongside the extensor hallucis longus. In order not to confuse the examiner's pulse the finger of the other hand should be held on the examiner's radial pulse. Palpation of the leg and comparing the same with the thigh or the other leg may show variation in temperature. Evidence of gangrene involving both the posterior tibial and dorsalis pedis indicates occlusion up to the bifurcation of the popliteal line. 2. X-ray examination of the lower part of the leg. The importance of this, however, is not to be overemphasized since marked calcification and arteriosclerosis may be present without evidence of gangrene. 3. For the past two years we have used the Pachon oscillometer.[7] The amplitude of the oscillations reflect the amplitude of the pulse and when occlusion has occurred the reading is markedly diminished. Since in our tests made on normals our instrument shows an oscillation amplitude of from 3 to 7 in normal; we determine occlusion when the reading is around 1 to 2 or less. The oscillometer, however, although it indicates the permeability of the vessel gives us no information as regards the collateral circulation. 4. There are other tests which we routinely employ. McKittrick and Root do not value as very efficient the Moskowicz test. We have used this test on every case and feel that it has some value. 5. There are other methods to determine the circulation such as the calorimetric test. We have up to the present writing no experience with these methods. If above tests show occlusion as high as the junction of the

middle and upper third of the leg, there is no gain by any amputation except one through the knee-joint or the lower thigh. If the popliteal is weak we advise thigh amputation. In some thigh amputations we have seen the occlusion even in the femoral but have ultimately obtained union after removing localized areas of necrosis.

We were very much disappointed in the mortality statistics following amputation. Some clinics give as low as 12 to 15 per cent. Our mortality rate at the Cook County Hospital in amputating diabetic gangrene has been 65 to 70 per cent. and can be reduced only when we operate early gangrenes and when we refuse amputation to those with evidence of marked heart and kidney disease. Our technique has been carefully planned to avoid any possible danger to this type of case. The cause of death in these cases has not been diabetic coma. Many of them survived the amputation for a week, dying of cardiac failure and with bronchial pneumonia. Some die of sepsis without much temperature or evidence of sepsis. It is possible that the very low grade of infection at the site of amputation is sufficient to bring on cardiac failure in a heart already damaged by a long standing coronary disease. To reduce the mortality in these amputations we have adopted the following technique: We refuse to amputate if the blood sugar is over 200 or carbon-dioxide combining power is under 40. Preparatory to the amputation digitalis is given for five days where possible. No preliminary scopolamin is allowed. Spinal anesthesia with 100 milligrams of ephedrine is used before the anesthetic. If the internist's estimate of the heart is such that he could not risk the use of ephedrine the operator should not risk amputation unless as a measure of last resort in the presence of severe infection.

In developing technique for leg amputation whether it be a Gritti-Stokes, the Carden, through the condyle of the femur, or the lower thigh, the following principles are to be borne in mind: 1. In cutting muscle flaps no ragged edges should be produced in order to avoid infection. 2. Sutures should not be tied too tightly. 3. If the patient is a poor risk, greater care should be used in expediting the operation than in worrying about the artificial limb. 4. No tourniquet must be employed. 5. Tissue must show a blood supply. For this reason we do not always do the Gritti-Stokes, employing this method only in younger individuals where there is some possibility of wearing an artificial limb. In older individuals we prefer a lower thigh amputation and in doing this we obtain much cleaner flaps by the fixation method, cutting with great rapidity, long anterior and posterior flaps, the anterior one being cut first; the bone is then sawed, the femoral ligated, and then the posterior flap is formed. This procedure even when not done with any haste but with great care should not take over five minutes. We have never split the femoral or had difficulty with hemostasis of this vessel. After cauterizing the sciatic we make a closure by sewing fascia to fascia and skin with silkworm gut. The entire procedure requires only 20 to 25 minutes. There is no need for haste. Such was the case when ether was employed and even in doing our early cases where we used local anesthesia. With spinal anesthesia or ethylene one can use meticulous technique in going through this procedure. The after treatment is important. The internist provides care for the heart and the diabetes. The surgeon must get his patient out of bed early since these old arteriosclerotics do not fare well by prolonged confinement to bed. We allow them to sit up on the second day and endeavor to encourage arm exercises. Following a thigh amputation it is well to give hypodermocysis in addition to the glucose used by the internist in proctoclysis, or by mouth.

CONCLUSIONS

1. Surgical judgment must not be swayed by too great a reliance on the use of insulin but must bear in mind the pathological changes which have occurred in the diabetic, and by the existing state of acid intoxication.

2. The surgeon should know how to take care of an emergency in diabetes but should not burden himself with the medical care.

3. It is probable that acid intoxication is the cause for the failure of the organism in its defense against infection.

4. The problem of the diabetic surgeon is to do nothing which disturbs the base balance and must make a careful choice of anesthetic, avoid

trauma, hemorrhage, shock, dehydration, and use intelligent treatment of infection.

5. Diabetic infections have a peculiar tendency to non-localization and necrosis, and are often deceptive because of the absence of pain.

6. Each lesion of the extremity requires a careful study of the circulation, of the general condition of the patient to stand an amputation. Amputation is not always required in gangrene but should be done early in the presence of infection or if the individual is young and the gangrene is early.

7. Spinal anesthesia with low thigh amputations probably afford the lowest mortality and the best wound repair.

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CONTROL OF DIPHTHERIA*

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LASALLE, ILL.

The author of this paper does not claim to have accomplished enough, in his own right, to merit being drafted by the secretary to write upon the subject. This paper must therefore be largely a compilation, and the result of deductions from limited, local statistical data. It may, perhaps, serve a useful purpose by calling attention to certain phases of the control of diphtheria. Noteworthy, however, is the fact that the district over which I happen to serve as health commissioner along with probably some others, has the enviable distinction of not having had even a case of diphtheria in 2½ years and no death in 3½ years. This district includes the cities of LaSalle, Peru and Oglesby, Illinois, with a combined population of approximately 30,000.

To What Is This Due? If toxin-antitoxin had been used extensively we would be very certain of the cause of the decline, but its use has been practically nil. Neither have our surrounding cities used it to the extent that we could be protected through them. Chicago, a comparative neighbor, during this period has had a considerable rise in mortality and an increase in the case fatality rate. Down state, as a whole, had a slight rise in 1927, and likewise the nation as a whole had an increase in mortality during the same period. Of course, an analysis of this national increase in mortality, during 1927, shows that a few large cities like Chicago, New York and Pittsburg are largely responsible. In other words it is largely an urban increase. However, most of the so-called rural states did show an increase during this year. The year 1928, however, shows quite generally a decrease to a new low level. The Metropolitan Life Insurance Company showed the effect of the increase in 1927 with a rise in mortality per 100,000 insured persons, to 10.2 over 9.5 for the previous year. For the year 1928 the rate fell to 9.4, which is the lowest ever recorded for the company; and the first quarter of the year 1929 gives promise of a continued decrease.

A Declining Disease. It is apparent that diphtheria is a declining disease, and has been on the decline for many years before antitoxin was discovered. A reference to the graph, here exhibited, of Chicago's diphtheria mortality from 1856 to 1928 shows three major peaks of about thirty year intervals, but the general trend was downward. One naturally feels that, were it not for antitoxin introduced in 1895, the third peak, with about 1915 as a center, would have begun much sooner and reached a much higher level than it did. Toxin-antitoxin was introduced in Chicago about 1917 to 1918, and it seemed was driving the disease to a new low level, when in 1927 and 1928 it again increased over 60% in incidence and nearly 100% in mortality.

Figures from New York City also show a rapid general decline in diphtheria mortality from 1874 to 1928; influenced markedly by antitoxin after 1898, and much less so by toxin-antitoxin, introduced by Park in the city in 1914

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and into the city schools in 1919. In fact a graph of New York City's diphtheria mortality rate, when the curve is smoothed by five year averages, does not show the influence of toxin-antitoxin.

However, the value of antitoxin and T-A has been demonstrated beyond argument time and time again in cities and institutions and control groups. There seems, however, to be a third factor or group of factors, which is not only influencing the decline of diphtheria, but some other diseases as well, particularly scarlet fever and tuberculosis. Apparently the old idea of the association of some of these diseases with filth was not entirely wrong, and that sanitation in all its phases has had considerable indirect influence. The increasing betterment of the standard of living and well being probably has played a part. Greater dissemination of education and greater activity of health departments generally, particularly in child welfare, aside from immunization, may be a factor. General racial immunity, from long contact with the disease, may also have been developing. All these factors have no doubt tended to protect the individual and increase his resistance.

Decline in LaSalle, Peru and Oglesby. Reference to the graph again shows, inserted, a smaller graph of diphtheria mortality for LaSalle, Peru and Oglesby, Ill. It is on the same scale as the larger graph for Chicago, but begins with the year 1915. In this year and for four years thereafter this district had a higher mortality rate than Chicago. In 1915 the Hygienic Institute began to function as a health department for the three cities. The trend of mortality, as shown by the heavy line, drops precipitately. Further, in 1925 the Hygienic Institute greatly expanded the scope of its work. The budget was increased from $21,000 to $38,000; four full time officials were secured to head the divisions; the nursing staff was increased from four nurses, without cars, to seven nurses with a car for each; all work was greatly intensified, but particularly the school work, and coincidently diphtheria disappeared. Practically no T.-A. had been given, either before or during this period up to 1929.

Now all this is only suggestive, but I do have some faith in its influence. I am not, however, credulous to the degree that I think diphtheria has been conquered in this manner. I am afraid that our record will be shattered most any time, and am preparing our schools and consulting with our physicians for the purpose of inaugurating a consistent and sustained campaign of T-A immunization.

Toxin-Antitoxin Campaign. This campaign is to be based upon deductions from our own diphtheria incidence covering a period of 14 years. After all, this is the real way to do any kind of health work, namely, the fitting of general knowledge to local conditions. The table exhibited shows that in the pre-school group the four-year old children had the most cases, followed by a 30% decline in the five-year old children. The effect of school then shows markedly by a 75% increase among the six-year old children, and a continued high incidence up to ten years of age. In the pre-school group there were 229 cases, while in the group from six to ten there were 281 cases. In the group from eleven to fifteen, who are also school children, there were 142 cases. This makes for the school group 423 cases against 229 cases for the pre-school group. For the rest of the age group there was a total of 120 cases. This makes a grand total of 523 cases above the pre-school age and 229 below this age. Now the author believes that if it were not for these 523 cases the 229 cases would not exist. The chance for contagion must be relatively slight in the pre-school group, when we have only 229 cases with a susceptibility percentage of 75 to 85%. This is often even higher in the rural districts. Contrast this with the next age group where we have 281 cases with about one-half the susceptibility percentage. In other words the amount and pressure of contagion immediately upon entering school is very much increased. This is shown vividly in the following summary of the statistical data.

DIPHTHERIA INCIDENCE LA SALLE, PERU, OGLESBY, ILL. 1914-29

Years	1st ½	2nd ½	1	2	3	4	5
Cases	2	3	20	42	48	67	47
Age Periods				229			

Years	6	7	8	9	10
Cases	82	56	52	57	34
Age Periods			281		

Years	11–15	16–20	21–25	up
Cases	142	46	30	44
Age Periods	142		120	

Now the individuals comprising all these groups above the first, not only have a relatively large number of cases, but there must also be

many undiagnosed cases and carriers. Besides this they are very active and are almost entirely responsible for the presence of contagion among the comparatively inactive and helpless pre-school group.

Now the point to all this is that we should center our attention earnestly on this six-year old group of school children, and attempt to immunize 100%. By so doing we will prevent the 523 cases that cause the 229.

Now some will say that you cannot immunize all the 1st grade in school; that it takes from three to six months to gain immunity after they are immunized in school; and that cases will develop before immunity has occurred. We must start somewhere, however, and there is not so much diphtheria every year, but what a start can be made in the first grade. Then if this is done consistently, energetically and regularly each year, there will be a high percentage immunized and no diphtheria to infect each incoming 1st grade, and eventually none to infect the pre-school group. Of course, the 2nd year group should then be Schick tested and the non-immunes immunized or re-immunized. Neither should there be any objection to mothers bringing into the school pre-school children if actual immunization is done in the school. The public or parochial kindergartens, where such exist, should probably receive attention.

It must be remembered, however, that I am proposing to center the attention and effort with the six-year old. Spasmodic campaigns of education and urging of the parents are of relatively little value generally, in so far as getting the end result desired. Efforts centered on the pre-school child are relatively costly and time consuming, because they are scattered and must be sought individually. The school group is therefore the logical one to work with. They are available and old enough to be stimulated directly, and they in turn both stimulate and educate their parents.

The Plan. We now have in operation a plan to stimulate the child to go to his family physician. This consists of a school wall chart, visualizing the child's defects, and suitably rewarding him with stars, buttons and ribbons for the removal of his defects and for becoming immunized to smallpox and diphtheria. The plan has not been used long enough to report on its operation relative to diphtheria immunization. The general scheme, however, is not new, except that we think we have developed some original details and methods of application. The wall chart is here exhibited. If we find that we cannot sufficiently stimulate our children to become immunized against diphtheria by this plan, we will try another. Many of our physicians have agreed then to come into the schools, for a fair remuneration, paid by the Hygienic Institute, and do this work on a larger scale. The parent would still be urged to go to the family doctor, but allowed to accept school service if he so desired.

Personally I feel that this matter of immunization for some diseases bears a different relation to the family physician than does actual illness. With illness there is the urge of ill health, which drives the parent to seek relief, but with immunization there is no such urge. Also with the diminution of case incidence the urge gets less and less, so that the last 10% of a conquerable disease becomes often unconquerable. Epidemics of communicable disease do occur, and when they do they become community problems, whose prevention and control was and is chargeable to the health department. If the physician cannot or will not assume his responsibility, become his family health officer, and get immunization done then the health officer must. I feel the problem will eventually be solved by the two forces recognizing their mutual responsibility to the public and working whole heartedly together.

Control of Epidemic Diphtheria. Now I do not intend to cover fully the control of epidemic diphtheria. Every one knows that the case must be found, reported, isolated and quarantined. That the contacts must be carefully supervised and if susceptible immunized. Carriers must be searched for, particularly in the exposed school children and when found, properly restricted. The source must be searched for, the milk pasteurized and all that.

I, however, believe much damage is done by too rigid quarantine, especially of wage earning adults. Too rigid measures, improperly directed, result in a hiding of the case. There is then a hesitancy on the part of the parents to call physicians for fear of the dreaded quarantine. This is fatal in diphtheria and may be true in other

illnesses. If physicians are called they are often seriously urged not to report it to the health department. I believe the wage earning adult, if he does not come into contact with the food supply or with children, and especially if he will agree not to come into intimate contact with the case, will not increase the spread of the so-called childhood diseases. To restrict these workers increases resistance to quarantine, and the result is an increase in the number of unknown cases over which we have no supervision at all. How futile then is our control. There will be some violation of liberal quarantine, but no more than of the so-called rigid type, unless a guard is actually placed at the door. Quarantine, commonly applied is only a seive or net, which catches and holds back the most severe cases, but lets the others get through.

SUMMARY

1. General sanitation in all its phases, including personal and eating house sanitation, the general abolition of filth; the attainment of pure water, pasteurization of milk, better housing, better living standards, etc., has probably greatly contributed to the general resistance to many diseases including diphtheria. There may have also been developing a gradual racial immunity to the disease from long contact. Auburn, N. Y., lost its diphtheria, due no doubt to intensive immunization, but what has caused its disappearance for three years from an urban community of 30,000 without immunization?

2. Antitoxin introduced in 1895, placed the natural decline of diphtheria on a much lower level than before that date.

3. Toxin-antitoxin has been proven in certain cities, institutions and control groups, to be an agent that would exterminate diphtheria if universally applied. This application most probably will come through whole hearted cooperation of the physicians and health departments to solve a community problem. The author believes that the six-year old child or the first grade in school is the place to direct an earnest and sustained campaign every year.

4. The usual restrictive measures in epidemic diphtheria should obtain, but with a liberal, properly directed quarantine. The object should be to decrease resistance on the part of the public and thereby find more of the cases to quarantine. The unknown case, unsupervised, is much more dangerous than the contact liberally and intelligently supervised.

DISCUSSION

Dr. V. M. Brian, St. Francisville: The time is now far past, but I want to make one or two remarks on the Doctor's paper. I think Dr. Ailes' paper reflects very creditably on the type of public health work he has been doing in the district comprising of La Salle, Peru and Oglesby.

I was not much surprised at his statement of no deaths, but when he said there had not been a case for the past few years, I could not help wonder if there was not some missed cases or what a close check up on the diphtheritic anti-toxin use in this district would show.

I agree with Dr. Ailes about the six year old group. Down in my district we have 25,000 immunized with toxin-anti-toxin and there has not been a case or death reported in any of these, but not so in the unimmunized group.

The continuous use of toxin-antitoxin in the on coming children is most important. The case and death rate will come up in a very short time unless this procedure is continuous.

THE LABORATORY IN RELATION TO PREVENTIVE MEDICINE*

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Edward Jenner was a practicing physician in a certain district in England. Smallpox was then a very prevalent and serious disease. Jenner noted that milkmaids whose hands had been infected with cowpox did not take smallpox. To test the matter further, he inoculated a series of human beings with material obtained from the infected milkmaids. These persons acquired cowpox or vaccinia. He noted that such individuals, after exposure, would not take smallpox. These facts are recorded in a classic published by Jenner in 1796.

We have here depicted in a nutshell the entire problem of disease control. Jenner the practitioner, the experimenter, the epidemiologist, the man interested in Public Health problems. In the century or more since that day, differentiation and specialization have occurred to an extreme degree. Today we have practitioners, experimenters in the laboratory, public health officials, and epidemiologists as separate special-

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ists. In the discovery of vaccination by Jenner, the correlation necessary for disease control was done in the brain of this one man. The correlation necessary to solve similar problems today must be made by many men or groups of men cooperating. This is often difficult to do. So it becomes necessary for us to discuss such problems as the relation of the Laboratory to Preventive Medicine.

The field of Public Health occupies a strategic position between the basic sciences on the one hand, and the practical field of Medicine on the other. In the latter field, the practitioner will always dominate the situation. It is he who must first make the diagnosis. Diagnosis should be accurate and the physician must be aided in every way to do this through the application of the fundamental sciences. Diagnosis is the first step in a survey. No campaign can be successfully waged against disease without first knowing where the disease is.

The function of the laboratory in relation to Public Health is twofold. First to apply the methods of the basic sciences to aid in diagnosis. This is a large field in which rapid advances have been made in recent years. The methods have become highly technical. The second function of the laboratory is that of research, a subject to which I will refer later.

In order to make this discussion as pointed as possible, I will now refer to certain diseases attracting the attention of both physicians and public health officials, the solution of which must largely depend upon progress in laboratory methods. We may consider two groups; one in which special problems present themselves, and in solving these we may depend upon the application of recognized principles. The problems in connection with the second group are apparently of a more basic character, and may be solved only by the discovery of new principles or new methods.

In the first group I will briefly refer to epidemic meningitis, hydrophobia, puerperal fever, scarlet fever, and undulant fever as striking examples. More could easily be given.

During the past year *epidemic meningitis* has been alarmingly prevalent in many localities in this country, including Illinois. Little progress has been made in controlling the transmission of this disease. We are familiar with meningococcus carriers, but we have not as yet worked out a practical method of identification and supervision. The serum therapy of this disease has been disappointing in many localities recently. Some years ago, we were elated over the fact that the mortality in this disease had been reduced from roughly 75% to 25% by intraspinal serum-therapy. Recently in many outbreaks, in spite of the use of serum, the mortality has been as high as before its use. In all probability, the method of preparation of certain sera in common use is at fault. These two problems apparently not fundamentally difficult in connection with meningitis present themselves for immediate solution in the interests of Public Health.

Hydrophobia has become increasingly prevalent in many districts, and, because of the serious nature of this disease, has been especially alarming. The results of the preventive treatment have been all that could be expected under the conditions. However, we now know, through long experience, that the Pasteur method of treatment alone will not solve the problem of rabies. This can only be done by the control of the dog; possibly of one or two other animals. As long as we have the problem of the stray dog, so long will outbreaks of hydrophobia appear. Vaccination of dogs against the disease may help, but it will never be completely practical in the United States. This disease furnishes an excellent example of the necessity for the medical profession to cooperate with the public in the eradication of disease. If our anti-vivisectionist friends would only seriously apply themselves to such a problem as the stray dog in a commonsense way, they might easily accomplish something worth while. The research laboratory work in connection with hydrophobia has been a series of brilliant accomplishments. But apparently it can do little more of a fundamental nature that will help. For a long time the profession have known enough to eradicate this disease and have told the people what to do. Yet today it still remains a serious menace.

Puerperal Sepsis is another infection altogether too prevalent in this country. Our statistics on the incidence of childbed fever at present are humiliating to American Medicine. Its wide prevalence in the United States as compared with other countries indicates clearly that we are not applying what we know as to its control. This disease furnishes a striking opportunity for proper cooperation between the laboratory and

the clinician. At present, numerous attempts are being made in various laboratories to obtain an effective anti-streptococcic serum. The outlook seems promising, especially in view of the recent discoveries of specific streptococcus toxins and in view of the results obtained with serums in such related diseases as erysipelas and scarlet fever.

The brilliant results of laboratory work by the Dicks in *Scarlet Fever* in the last few years have made us feel more hopeful as to its control. However, as so often happens the brilliant discoveries already made have given rise to numerous problems and difficulties, some of which at least must be overcome before we can consider this problem solved. We await with feverish anticipation the outcome of serum therapy in this disease. The outlook is encouraging but we know, only too well, that so many unforseen difficulties may arise in connection with the successful serum therapy of any disease, that naturally we assume a conservative attitude toward its specific therapy.

Undulant Fever. Little or nothing was known of undulant fever only a few years ago. Now it has suddenly become one of interest to every practitioner and public health official of the State. It presents numerous problems of especial interest to Agriculture and Medicine. It is another one of our so-called human-animal diseases, and presents many of the difficulties often encountered in the control of this group. Fortunately we have a fairly dependable method of laboratory diagnosis to aid the physician, and progress in the campaign against this disease will probably be rapid. It is of interest to point out that this disease and septic sore throat are the two diseases that at present are presenting the most difficult problems to the Certified Dairy Industry. This is on account of the difficulty of detecting the animal carriers.

The above mentioned diseases are examples of infections in which the etiology and transmission are quite definitely known. As stated above, the problems remaining unsolved are not fundamental in character. At least we feel that they can be attacked along well defined and rational lines. There exists a second group of diseases presenting problems which are essentially different from the standpoint of etiology, in that we know practically nothing about their causation. Usually the laboratory problems in such diseases are difficult of approach. As striking examples we may mention the influenzas, including colds, diabetes, cancer, and the cardio-vascular-renal group. Many more could be given.

In the face of an influenza epidemic today we are practically as helpless as we were a hundred or five hundred years ago. Every public health officer as well as every laboratory worker and physician should consider this disease seriously as a problem for solution. There are difficulties all along the line, from the work of physician who first sees the patient, to the epidemiologist who attempts to determine the laws of the epidemic as well as to the laboratory worker who tries to learn something of its etiology.

Diabetes is becoming more and more alarming every year in spite of the discovery of insulin. It is on the increase due, perhaps, to the way our people live; to their sedentary life and to their habits of eating. Some blame our prosperity; others our intemperance. The specific cause of diabetes, of course, is as obscure today as ever. From the Public Health standpoint, this disease is another striking example of the necessity for the cooperation of the medical profession with the public. The people in general, no doubt, will continue to persist in creating or promoting disease, and then will put the problem to the physician to solve. It is unnecessary to say that the discovery of the specific cause of diabetes is today one of the most important research problems before the laboratory worker in medicine.

Cancer may well be mentioned, but the problem has been discussed so often that it is superfluous to do more than place it here along with the other diseases referred to. Attention is called to one point, namely, that it is becoming increasingly evident that the diet is important in relation to the progress of cancer. An excessive or a carbohydrate diet may have something to do with the present apparent increase in the incidence of this disease. This is a problem about which, no doubt, we shall hear very much more in the immediate future.

The *Cardio-Vascular-Renal* group affords innumerable clinical and laboratory problems as to causation, distribution, diet, etc. The interest and attention of Public Health officials and laboratory workers, no doubt, will be directed more and more to this large group of serious diseases.

An interesting phenomenon in connection

with laboratory work extending over a period of years is its variability. Only a few procedures in the laboratory become permanent. Methods are constantly changing, for two reasons. Improved methods are introduced constantly to replace older and obsolete ones. For example, the Wassermann test, which has occupied such a prominent place in the laboratory for some years, is now being rapidly replaced by other simpler methods. In the second place, the diseases in a community are changing from time to time. When one analyzes this point, one is struck with the rapidity of change in the incidence of diseases from decade to decade. In "The Rise and Fall of Diseases in Illinois," recently published by Rawlings from the State Department of Public Health of Illinois, it is interesting to note the diseases that occurred here fifty to seventy-five years ago. Cholera, yellow fever, milk sickness, snake bite, typhoid fever and malaria were common diseases and met with frequently by physicians. Now, these diseases have disappeared or are becoming relatively rare. At the present time, on the other hand, we are recognizing such interesting diseases as rabbit fever, undulant fever, septic sore throat and fungus diseases of various kinds. The kind of laboratory work made necessary by these diseases involves new procedures. The laboratory, therefore, must constantly adjust itself in relation to the prevailing diseases of the period.

Again if we look into the future, we may safely predict that some of our present diseases will disappear, or become relatively rare, as typhoid fever has done in the recent past. Infectious diseases in children, intestinal diseases, and tuberculosis are now reacting in this way. Furthermore, we may be sure that in the future, laboratory work, both research and routine, will be occupied very much more with the diseases referred to above, namely pneumonias, influenza, poliomyelitis, encephalitis, cardio-vascular-renal diseases, diabetes and cancer.

Another point worthy of comment may be mentioned here and that is that the tendency in laboratory procedures, as they become more and more refined, is away from biologic methods, to those of chemistry and physics. This tendency has been quite rapid of late, and no doubt will continue in the future.

It will be clear from what has been said above that the research problems in connection with disease will become more and more rational and, therefore, more and more dependent upon pure sciences. Speaking broadly, it is the laboratories of the universities and institutes that deal primarily with such problems. Hence it behooves us to establish close relationships between such laboratories and our Departments of Public Health. There is nothing new about this. It has been done and is now being done all over the world.

A new feature in the development of laboratory work is the increase in the volume of specimens from normal individuals, to which attention has been called by Dr. Thomas Hull of our State Department of Health. This is occasioned by the interest manifested in the so-called periodic health-examinations. This is an important phase of preventive laboratory medicine, and should be encouraged in every possible way. No doubt, in the future, we may expect a continued increase in the amount of work of this kind.

Dr. Hull also calls attention to the great increase that has taken place recently in the number of laboratory examinations made for public institutions. By public institutions are meant primarily the institutions operating under the State Department of Public Welfare, namely, insane asylums, hospitals, special institutes, prisons, etc. This is gratifying in that it indicates that far more attention is being given to the health of individuals who are unfortunate enough to become wards of the state. No doubt, the number of laboratory examinations is a fair index of the standard of medical service that is rendered to these people.

As a concluding statement, may I refer to some matters of interest to Illinois from the historical point of view. The State Department of Public Health is rapidly taking its place with the most advanced Health Departments in this country. The creative and productive type of work should be emphasized more and more and, no doubt, this will be done. In the seventies of last century, Dr. Thomas J. Burrill came to Illinois and was made Professor of Botany at the State University. He exercised a powerful influence for years in the university, and at one time was Acting President. In 1877 he began to teach bacteriology as a definite part of the

botany schedule. This was the first systematic work given in bacteriology anywhere in the country. At one time he had charge of a laboratory to prepare vaccine virus under the direction of the State Board of Health. From first to last, Burrill emphasized the creative and investigative side of bacteriology and laboratory work, and through his contributions he became an outstanding leader in the field of bacteriology. His specialty was the bacteriology of plant diseases. He and Dr. Erwin F. Smith may be looked upon as occupying the same relative position to plant pathology that Pasteur and Koch do to animal pathology. They were years ahead of the rest of the world in their work in the bacteriology of infectious diseases in plants.

Too much emphasis can not be given to the historical aspects of the laboratory in relation to Public Health. In this connection we may mention the importance of an institution for the historical study and presentation of the field of Medicine. It is of especial importance from the point of view of laboratory work and the teaching of Public Health. In a state like Illinois and in a cosmopolitan center like Chicago there should be a great Public Health Museum designed to illustrate the history and development of Public Health in its broad aspects. This, if properly arranged, would cover practically the entire field of medicine, both theoretical and practical, as well as laboratory and field work. It should be on a scale comparable to the Art Institute or the Field Museum or the proposed Industrial Museum in Chicago. American Medicine, and, especially, the Medicine of the Central West, should be emphasized, and the diseases we meet here should be depicted in all their phases. Such an institution would serve many purposes. It would be invaluable for teaching both in graduate and undergraduate work and would bring together the various medical sciences and specialties as could be done in no other way. Especially would it reveal relations between routine work and the outstanding discoveries in laboratory development and practical field work. Our institutions have been provided with many small museums highly specialized so that they are of little general interest. We have neglected to reveal the larger relations in our sciences to ourselves and to the public.

In such a museum could be illustrated the history of disease in all its phases, together with the efforts of man, successful and unsuccessful, to combat its ravages. Here also should be included all phases of veterinary medicine, as well as the subject of comparative medicine in its broadest aspects.

Our people now stress health as has not been done since the Grecian era, and we may well be proud of our accomplishments in this regard. It would seem altogether fitting that we should have a splendid medical and public health museum, quite on a par with other institutions and serving not only the medical profession in its practical and teaching work, but also the public where they may be free to go and learn all about their bodies and its afflictions. This should be a proper place for the education of parents and children in physiology, sex matters, personal hygiene, care of teeth, etc.

One of the most important lessons that we should appreciate is the great complexity and the vast scope of the field of Public Health. It is not a definite science but comprises a great body of knowledge about as broad as experimental science itself. For that reason the study of Public Health should be excellently adapted for general educational purposes. In this field, not only are the fundamentals of practically every laboratory science applied, but here is ample opportunity for the study of classics, the humanities, social problems and economics; for all civilizations have been profoundly influenced by problems of health and disease.

DISCUSSION

Dr. Walter G. Bain, Springfield: We are very glad to have had the opportunity of listening to Dr. Davis' very comprehensive and very instructive paper.

As a laboratory worker practically all my life, I find one situation which, I think, tends to lessen the value of our laboratory work more than anything else. This is that both public health workers and physicians many times fail to attach the right importance and proper interpretation to laboratory findings.

As illustration, from the standpoint of the public health worker, there is great importance attached to the bacteria count in milk. A high bacteria count is interpreted as conclusive evidence of a disease-producing germ in milk, while, as a matter of fact, it is only evidence of improper handling of milk and should be used only as an indicator of unsatisfactory conditions governing a source of milk supply.

From the standpoint of the physician, a patient's blood is examined for the Widal test and result is

negative. The physician may consider this one test sufficient to rule out the possibility of typhoid fever, whereas a later specimen of blood may give a positive Widal.

The same thing is true in malaria. If the specimen of blood is obtained after the physician has given quinine, the laboratory finding is, of course, negative, and if the physician dismisses from his mind the possibility of malaria, he is not giving a correct valuation to the laboratory work. I had an exmaination not long ago, where the patient had been in the hospital the previous season, with temperature. Malaria test was negative during the first hospitalization and when the patient returned with no previous quinine medication, we found malaria parasites very abundantly.

Professor Davis spoke of serum for meningitis not giving the results which were expected, as compared with those previously attained. My experience convinces me that unsatisfactory results with meningitis serum is entirely due to improper administration.

We have had many cases at St. John's Hospital, Springfield, and have always had prompt and satisfactory reaction except in cases which were complicated with infection outside the canal, or outside the ventricles, previous to the serum injection. We have had cases where very slight chance was entertained for recovery, cases highly delirious, show prompt improvement when we gave the serum in sufficient quantities.

Oftentimes insufficient diphtheria antitoxin is given at the beginning and the reaction is unsatisfactory for that reason.

In our work at the hospital, we have followed this procedure: We withdraw thirty-five (35) cc. of the spinal fluid and replace with thirty (30) cc. of serum, twice daily and continue until the spinal fluid clears.

We seldom fail to get results when we have given our serum in that way. I believe this failure on the part of the profession to get results in meningitis is due to the fact that too little serum is administered, rather than that the serum is not properly prepared.

In closing, I want to express along with Professor Davis my very great regard for the work of Professor Burrill. It was my privilege to be associated with Professor Burrill for two years at the University of Illinois, and the inspiration of Professor Burrill and his work has been a very potent factor to me in my work.

Dr. G. Koehler, Chicago: I want to say a few words of praise in favor of this most interesting, comprehensive and instructive essay presented by Dean Davis. The Section owes Dr. Davis an apology for not having a larger audience here to hear this most excellent paper. There is much food for thought in this essay.

I particularly agree with the proposition of starting a public health museum. More attention should be given to the historical phase of public health. The public health workers and the medical profession are neglecting to preserve the records, apparatus and instruments that the pioneers in their professions used. Their preservation and subsequent exhibition would serve as object lessons to the public in the health education campaign which is bound to form an important part of the civilization of the future. In order that the public may reap the benefits of the great discoveries in the field of preventive medicine, it is necessary that they be familiar with the facts. A museum, such as Dr. Davis proposes, would be a potent factor in spreading such information. Educational work of that kind would do a great deal now and in the future in the education of the public.

Let us consider how much more beneficial it would be to present to the public the equipment used by Koch in formulating the fundmaental rules of bacteriology, than it is to show them the armor worn by a medieval knight or the sword used by a general who conquered an army in Mexico.

The armamentaria of many of the pioneer workers in medecine are lost. In the future these things will be of great interest, and yet they are not being preserved.

The museum suggested would serve a two-fold purpose; first, to preserve those things which will be of great interest in the future, and, second, to serve as a great educational institution, for the purpose of bringing home to the people the outstanding discoveries in medicine, and the facts in regard to the origin and preservation of disease, the knowledge of which would result in their utilization for the preservation of health and the prolongation of life.

Dr. C. R. Smith, Decatur: This essay of Dr. Davis was given under the auspices of the Illinois Medical Laboratory Association, and as President of the Association I wish to extend our thanks to Dr. Davis for the paper.

Dr. Grace Wightman, Springfield: I should like to ask Dr. Davis what plans are worked out along the lines he suggested for a museum or educational exhibit for the Chicago World's Fair?

Dr. D. J. Davis, Chicago (closing): In reply to the questions asked I will say that what I have said concerning a museum is merely a suggestion made with the hope that in connection with the coming World's Fair in Chicago something in the way of a permaennt medical museum might be established. If a permanent building could be erected, it would be a splendid thing for the development of medicine and public health in Illinois. I understand that committees are at work considering the larger aspects of the World's Fair, and if anything is to be done it should be done shortly. Activity along this line on the part of such organizations as the State Medical Society, State Department of Health, Chicago Medical Society, nursing organizations of the State, and many others might bring this about. A medical museum properly organized might serve the people in a medical way quite like the Art Institute serves them from the standpoint of art.

SOME DIAGNOSTIC PROBLEMS IN TUBERCULOSIS*

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No subject has occupied a larger share of medical attention during the past quarter century than the diagnosis of tuberculosis and in no subject has agitation been more fruitful of results. Twenty-five years ago, tuberculosis stood first among the causes of death and the disease was rarely recognized until it had reached a more or less advanced stage. Today tuberculosis stands seventh among the causes of death and the diagnostic proficiency of physicians has greatly improved. In fact, we have now reached the encouraging place where critics declare that cases are being diagnosed as tuberculosis which are not tuberculous,—a gratifying reversal of conditions of a couple of decades ago.

While the diagnostic earmarks are more widely recognized and while early diagnosis is far more general than in the past, there is still ample reason to continue agitation for early diagnosis. Sanatoria are still crowded with advanced and terminal cases whose chances of recovery have been lost through delay in recognition of the nature of the disease.

In fact, the diagnostic refinements and short cuts which have developed during the past few years, valuable though they unquestionably are, appear to have led to the neglect or abandonment of procedures which were quite dependable in years gone by. Many physicians are led astray by blind dependence upon the x-ray;—not only by relying upon poor plates and unreliable interpretation by professional Roentgenologists; but by the actual limitations of x-ray in early chest diagnosis. The case history,—now as always the most important factor in diagnosis,—is frequently slighted or relegated to an inexperienced assistant. The established means of physical examination have suffered neglect in a day in which we have been somewhat blinded by the brilliant promises of the laboratory.

Singularly enough, in a day of laboratory enthusiasm, we have come to overlook the most important thing the laboratory has ever offered us in this particular disease. In many cases, where elaborate examinations and tests have left us in confusion, a series of sputum tests—perhaps twenty to fifty, perhaps only one or two, has definitely cleared the atmosphere. It may stretch your credence when I say that, among the patients received at our sanatorium, in many of whom diagnosis was seriously delayed, about 40 per cent. have had no sputum tests.

In the main, however, diagnosis of the existence of tuberculosis is far better than in the past. There are still several simple, but all-important problems, however, which have not received sufficient consideration.

Having concluded by the more refined tests, by the existence of physical signs and x-ray shadows, that tuberculosis exists, there appears to be difficulty in determining what to do about it. There seems to be a great deal of confusion in differentiating between tuberculous infection, which is a very widespread condition rather than a disease; healed tuberculosis, which is no longer active, and clinical disease which requires definite and persistent treatment. Part of the confusion is due to the fact that extent of involvement and activity are two entirely different things. We fail to recognize that the patient with very early tuberculosis, as determined by x-ray shadows and physical signs, may be critically ill, while the patient with far advanced tuberculosis, as determined by the same criteria, may be able to engage safely in a gainful occupation. Evidence of failure to recognize activity, regardless of extent of disease, is found in the fact that many patients who are seriously ill, arrive at the sanatorium unattended, by interurban or bumping automobiles, while others who are only slightly ill, arrive by ambulance and expect to be fed by hand.

There are certain questions determining the illness of the tuberculous patient which laboratory procedure can never answer and which must be settled by the observation, the experience and judgment of the physician.

There is also reason to believe that continued failure may be due to lack of clear differentiation between tuberculosis and other conditions which may simulate tuberculosis, and particularly to a failure to recognize that tuberculosis may coexist with almost any other disease.

Early tuberculosis often presents a picture of low grade toxemia in which pulmonary signs are negligible or altogether absent. This picture is

*Read before Section on Medicine, Illinois State Medical Society, Peoria, May 21, 1929.

practically identical with that of so-called neurasthenia, of focal infection and of thyroid disease. At times, the entire picture is found, by a process of elimination, to be due to tuberculosis alone. At other times tuberculosis may be satisfactorily excluded. Again, clinical tuberculosis may be found to coexist with some other form of infection. The reluctance of patients to accept a diagnosis of tuberculosis and the reluctance on the part of many physicians to make it, often leads to a diagnostic program in which tuberculosis is left to be the last, unavoidable conclusion.

As a result, many patients reach the sanatorium, after a series of surgical adventures, frequently with their chances of recovery seriously impaired by repeated shock and repeated general anesthesia. Teeth have been extracted, tonsils removed, gall bladder drained, appendectomies performed, pelvic organs mutilated and thyroids operated on and yet the toxemia persists, the slight temperature continues and we reluctantly conclude that an underlying tuberculosis is wholly or partly responsible for the picture. I do not mean to imply that tuberculosis is the cause of all or even a majority of such clinical pictures; but I do insist that tuberculosis is present in a sufficient number of cases to warrant extreme caution. It should be borne in mind, in case of doubt, that the routine rest cure of tuberculosis can do no harm in any case which simulates tuberculosis, and may do a great deal of good in preparing the patient for his surgery. The rest period will at least afford opportunity for clearing up the diagnosis. On the other hand, surgery and general anesthesia may seriously impair the chances of recovery from the underlying tuberculosis if it exists.

I have in mind a woman from northern Illinois, presenting a clinical picture of hyperthyroidism,—high basal metabolism, tremor, palpable thyroid, nervousness and rapid pulse. She was sent to the sanatorium for the purpose of eliminating tuberculosis, to assure safety in anesthesia, and, in the absence of tuberculosis, to prepare her for thyroidectomy. During her stay of a few months, tuberculosis was conclusively proven by sputum tests and clinical evidence. During the period of complete rest, the thyroid symptoms largely disappeared, the basal metabolism rate dropped to normal and operation was no longer considered. In this case thyroidectomy certainly would not have cleared up the underlying tuberculosis; but would probably have increased and activated it. By keeping in mind the possibility of tuberculosis, which could not at that time be proven, and giving the patient the benefit of the conservative course, surgery was avoided and the patient was put in the way of recovery.

In the records of some two thousand cases in our sanatorium, one is struck by the frequency with which active tuberculosis follows surgery and general anesthesia, — the frequency with which health remains impaired after operations on tonsils, appendix, gall bladder, pelvic organs and thyroid,—operations all too frequently done in search of the source of focal infections; operations for the relief of a clinical picture which frequently characterizes early tuberculosis.

Certainly our records justify this word of caution: In case of symptoms of low grade toxemia, be sure to eliminate tuberculosis before giving a general anesthetic or resorting to surgery, and this whether you are able to demonstrate a definite focus of infection or not. Bear in mind that diseased tonsils and tuberculosis may coexist; that a chronic appendix and tuberculosis may coexist and that surgery of either tonsils or appendix, especially with general anesthesia, may relieve one condition; but may light up another far more serious.

Incidentally we are at times led astray by the acceptance of poorly founded medical axioms or rules of thumb. Not infrequently pulmonary tuberculosis is overlooked in the presence of organic heart disease in the belief that the two are not likely to coexist. And the same is true in regard to asthma in which the clinical picture is often due to tuberculosis with a large amount of fibrosis. Errors are also common in assuming that pulmonary tuberculosis necessarily begins in the apices. Advanced tuberculosis of the middle or lower lobe is at times concealed under a diagnosis of abscess.

Judging from considerable numbers of patients, from all classes of physicians, one is inclined to feel that, at the present time, the chief unsettled questions in dealing with the tuberculous are: 1. The determination of the exact illness of the patient as based upon both extent and activity of disease; 2. The decision of the

exact character of treatment and especially the amount of rest; 3. The appreciation of the relative unimportance of medical treatment as compared with definite training and regimen; 4. The decision as to when the process has become quiescent and the changes in discipline which may be justified by the stages of improvement; 5. A real conception of what is meant by rest.

It is obviously impracticable to discuss these subjects in detail at this time. It may be said, however, that, when a diagnosis of any degree of activity is made, treatment, in which complete rest is the chief factor, should be begun at once and carried to the limit. Many cases go to an advanced or terminal stage because the extreme gravity of even minimal evidences of activity are not appreciated and because discipline and treatment are carried out indifferently. What may be done for the patient with a temperature of 99.4 is more important than what may be done with the patient who has cavity and hemorrhage.

In the treatment of early tuberculosis, regimen is all-important; medical treatment relatively unimportant, and often harmful. Tuberculin, vaccines, nauseous drugs, iodine, calcium, inhalations, heliotherapy are at best merely adjuvants which must be used with caution. The indiscriminate use of light therapy—quartz lights, ultra-violet lights, natural sunlight—valuable though these may be in carefully selected cases, is now undoubtedly adding to unnecessary failure and wreckage.

Finally, attention should be directed to the fact that perhaps a majority of the failures which occur in curable cases, take place after all signs and symptoms of the disease have disappeared—in that very critical period of readjusting the patient to his normal life. At this time x-ray and other of the more refined means of diagnosis are useless; temperature and sputum tests may or may not be of value; repeated physical examinations may aid us if our records are exact and detailed. It is here that constant observation by the doctor;—the man and not his mechanical tool kit,—the employment of thought, intelligence, time and sound sense will often save the day.

Perhaps I am prejudiced when I say that, in no other field save nervous diseases, is the personal attention, the close observation, the psychology, the watchful and continued observation, the unwarped judgment of the doctor so imperatively needed as in tuberculosis.

DISCUSSION

Dr. Emmet Keating, Chicago: Dr. Palmer's paper teaches one a great lesson, and that is that we must make careful and repeated careful physical examinations.

He has pointed out that many things may simulate tuberculosis, and tuberculosis may simulate many other things.

I just want to say a word about what he said about treatment. There is no doubt that rest and food and fresh air are the foundation of all successful treatment. But we must remember the psychology of the individual. We must remember that these patients must be kept interested, amused if you will; and that all of the lights and all of the various physiotherapeutic measures, as Dr. Palmer has said, may be instruments of great harm if not used by sensible men.

But if these things are used by sensible men in a sensible manner, they have a certain definite and specific value of their own, and they have a very great value in keeping the patient interested in doing what the doctor tells him to do.

Dr. Walter G. Bain, Springfield; I was a little disappointed that the doctor omitted a reference to chest conditions and gastro-intestinal disturbances.

I have been very much impressed with the frequency with which cases come into our institution as cases of gastro-intestinal trouble, when the primary condition was one of pulmonary tuberculosis. So often has this happened, that I am of the opinion that every case of gastro-intestinal symptoms which are not definitely of an acute type, should first be carefully examined for pulmonary tuberculosis.

I also believe that chronic conditions of the gastro-intestinal tract, such as chronic appendices and gall bladders, undoubtedly will lay a very fertile foundation for a later pulmonary tuberculosis and the relation of these, I think, is one which should be constantly kept in mind.

Dr. S. E. Munson, Springfield: I think this paper is very timely because we see so much in the literature at the present time of the decrease in mortality from tuberculosis.

I think the doctors are rather lulling themselves to the lack of importance of their former definite efforts to diagnose tuberculosis early.

In recent years the tuberculosis sanatoria throughout the country have been thinking very much about the care of the chronic cardiacs—that is, of chronic heart disease. I really believe that in a few years more the statistics will show that tuberculosis is not on the de-

crease as much as we feel. A group of us in Springfield take care of the dispensary work, and all the cases sent to St. John's Hospital Sanitorium are first passed upon by this group of men.

No doubt the visiting nurse and all of these factors have aided a great deal in lessening the mortality, but the prevalence of tuberculosis is yet, I think, very great. The mortality, of course, is not so great, and we only judge the prevalence of tuberculosis at the present time by the mortality statistics.

We see a great deal of group tuberculosis in the dispensary. Cases that come in where there is some member of the family that has tuberculosis, or there is a contact. It is here that so much work can be done by the physician in the prevention of tuberculosis.

A few months ago a family who had taken one member to Denver, Colorado, because he had tuberculosis, wandered around out there until this person died. They finally returned home with another one hopeless. Other members of the family came to the dispensary for diagnosis. The one who died was about eighteen, and there were three or four members of the family who were younger. The one in a hopeless condition was about sixteen. These cases then came under observation down to the smallest child. The condition of their tonsils was frightful.

As I have grown older in the practice of medicine I think more seriously about the tonsil situation in children than I did years ago, because all the time in most every case where there is tuberculosis in the family some of the younger members have serious tonsil conditions. When there is this condition of the tonsils we have an involvement of the glands of the neck, and it is only a short step until an involvement of the bronchial glands takes place which brings about active tuberculosis in the adolescent years.

Dr. George T. Palmer, Springfield: I am glad Dr. Keating called my attention to my apparent lack of emphasis on the treatment of the tuberculosis patient, merely passing it on with the idea that the drug administration was relatively unimportant, because I know of no class of patients who require more constant attention, more constant treatment, more ingenuity on the part of the physician in keeping the patient feeling that something is being done for him.

Yet I do think a word of caution is timely that the doctor should not fool himself about any particular drug that he is going to give having any material effect on pulmonary tuberculosis.

I am exceedingly glad of and indebted to Dr. Bain for the emphasis on the frequency with which pulmonary tuberculosis is found in the guise of the various chronic gastro-intestinal disorders.

I think Dr. Munson is pointing out a fact when he says that our great optimism about the disappearance of tuberculosis is premature. In a great many of the larger centers of population, at any rate, they are already reporting an increase in the pulmonary tuberculosis during the past two or three years.

CANCER IN EYE, EAR, NOSE AND THROAT PRACTICE*

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This paper is based on the last 250 case histories in the current files of the Cook County Hospital. These histories comprise all the records that could be found of cancer involving the regions of the eye, ear, nose, throat, larynx, trachea, bronchi, lungs, and thyroids. The most striking feature of these records is the overwhelming number of males as compared with females — over seven times as many men as women. There must be some reason for this great excess of men, and this study was undertaken to find out if possible what influences caused the difference in incidence in the two sexes. To this end the various facts which might have a bearing on the question were tabulated as far as possible. Many of the records are incomplete in various respects, but it is thought that enough information has been obtained to throw some light on the etiology of cancer as concerns the Eye, Ear, Nose and Throat specialist.

Taking up the various points in detail we find as to

Location:	Males	Females	Total Cases	% of Males	% of Females
Eyelids	4	2	6	67	33
Orbit	3	1	4	75	25
Auricle	6	1	7	86	14
Septum	1	0	1	100	0
Antrum	6	5	11	55	45
Sarcoma of antrum.	1	0	1	100	0
Ca. of other sinuses	0	1	1	0	100
Lips	27	1	28	96	4
Face	9	1	10	90	10
Mouth	9	0	9	100	0
Cheek	3	0	3	100	0
Mandible	4	0	4	100	0
Branchial Cleft	2	0	2	100	0
Neck	1	0	1	100	0
Thyroid gland	1	4	5	20	80
Tonsils	15	0	15	100	0
Tongue	30	1	31	97	3
Lung	13	4	17	76	24
Epiglottis	4	0	4	100	0
Larynx	16	0	16	100	0
Pharynx	1	0	1	100	0
Esophagus	66	8	74	89	11
Totals	221	29	250		
Negroes	11	2	13	85	15
Whites	210	27	237	89	11

Relative percentage of negro men to white men—5% to 95%.

*Read before Section on Eye, Ear, Nose and Throat, Illinois State Medical Society, Peoria, May 22, 1929.

Relative percentage of negro women to white women—7% to 93%.

Arranged in the order of their frequency the organs involved were:

Esophagus	74
Tongue	31
Lips	28
Lung	17
Larynx	16
Tonsils	15
Antrum	11
Face	10
Mouth	9
Auricle	7
Eyelids	6
Thyroid gland	5
Orbit	4
Mandible	4
Epiglottis	4
Cheek	3
Branchial cleft	2
Septum	1
Sarcoma of antrum	1
Ca. of other sinuses	1
Neck	1
Pharynx	1

Social State:

Married	Single	Divorced	Widowed	Not given
96	46	7	47	54

There is nothing very apparent in the social state that indicates a cause for cancer.

Ages:

11 to 20	1 case
21 to 30	2 cases
31 to 40	14 cases
41 to 50	58 cases
51 to 60	78 cases
61 to 70	74 cases
71 to 80	15 cases
81 to 90	2 cases

In the decades of 41-70 there were 210 cases, or 84% of total. The youngest patient was 20, the oldest 82. Age is evidently an important factor in the occurrence of cancer.

Use of Tobacco:

10 denied using tobacco.
30 used tobacco in moderation.
8 used tobacco to excess.

13 smoked a pipe which probably meant almost constant smoking. In other words, 10 denied using tobacco and 51 admitted using it, a relative percentage of about 16½% to 83½%. Cancer was five times as common in smokers as in non-smokers.

Alcohol: 17 denied using alcohol, and 47 admitted using it. Cancer was about three times as common in the users of alcohol.

Syphilis: 121 denied syphilis and were not shown by the Wassermann test to have it. 22 either admitted having had syphilis or had a positive Wassermann. Syphilis thus could not be shown to cause an increase in cancer incidence for with an occurrence of a positive Wasserman of about 16% as reported from two Chicago institutions that make Wassermanns on all patients, about 23 of our patients should have had a positive Wassermann. The incidence of cancer is the same in both syphilitics and non-syphilitics.

Condition of Teeth:

85 had bad teeth. 31 had several or all the teeth extracted, making a total of 116 who had, or had had bad teeth. Only 3 were noted as having good teeth, and no radiograms were taken of these. Bad teeth are known to have been present in about 98% of the cases, where their condition was noted. Most of the mouths were veritable cesspools.

Condition of Tonsils: This was noted in but 18, 4 were large, and 14 showed infection. In view of the filthy condition of most of the mouths, it is likely that all the tonsils carried infection.

Injuries: 11 had had injuries which seemed to stand in casual relation. Among them were cuts, bites, burns, sunburns, and poorly fitting dental plates.

One patient gave a history of appendicitis, one of arthritis, one of having inhaled fumes of nitric acid and of swallowing phenol, and one cancer developed on the scar of a healed lupus.

Heredity: Heredity was admitted in 6 cases and denied in 67. Of those admitting heredity of a familial incidence

No. 16 with cancer of auricle had a brother with cancer of forehead.
No. 102 with cancer of throat had a sister with cancer of stomach.
No. 118 with cancer of lung had a sister with cancer of breast.
No. 156 with cancer of larynx had an aunt with cancer of stomach.
No. 193 with cancer of esophagus had a mother with cancer of stomach.
No. 205 with cancer of esophagus had a father with cancer, location not given.
No. 86 with cancer of neck had a wife with cancer of face.
No. 108 with cancer of tongue had a wife with cancer of stomach.

Since 92% of those where heredity is noted denied having cancer in the family, and only 8% admitted it, the case for heredity as a cause of cancer is not very strong. Of the six patients who admitted heredity, the aunt of No. 156 might or might not have been a blood relation.

For any anatomical structure to be hereditary

it is supposed that its antecedents were in some particular chromosome or its hypothetical gene. This being the case, a hereditary anatomical peculiarity should always appear in the same place in the same organ or structure. A son with a supernumerary finger on his right hand could hardly claim heredity if his father's supernumerary digit were on his left foot only.

If the sexes of parent and offspring were different, the hereditary peculiarity should at least be in analogous organs; thus if a father had cancer of the prostate, the daughter should have cancer in the uterus, or if the mother had cancer of the uterus, the son should have cancer in the region of the prostate.

If the mother had cancer of the breast, the son should have it in the same organ, and since disuse or non-use is considered by some to predispose to cancer, the son should be all the more likely to have cancer of the breast if his mother had it in the same organ. Has anyone ever noted cancer of the breast in the son of a woman who had cancer of the breast? If it has occurred, I have failed to note such an occurrence either in my reading or in my practice.

It is possible that No. 16, who had cancer of the auricle, while his brother had cancer of the forehead, had the lesion sufficiently near the locality to be considered the result of heredity. The same may be said of No. 193, who had cancer of the esophagus and whose mother had cancer of the stomach. But No. 103 with cancer of the tonsil while his sister had cancer of the stomach, could hardly have inherited it in the same chromosomes, much less the same genes. The same holds true for No. 118, who had cancer of the lung while his sister had cancer of the breast, and for No. 156, who had cancer of the larynx while his aunt had cancer of the breast.

Cases 86 and 108 are illustrations of both husband and wife having cancer. If the disease were communicable these might be considered illustrations of contagion, or they might both have been exposed to the same causative agents.

Occupations: In the order of their frequency the occupations were:

Laborers	88
Housekeepers	12
Salesmen	4
Janitors	4
Watchmen	3
Engineers	3
Carpenters	3
Tailors	3
Porters	3
Teamsters	2
Cooks	2
Photographers	2
Painters	2
Machinists	2
Firemen	2
Moulder	1
Actor	1
Steamfitter	1
Buyer	1
Welder	1
Farmer	1
Chef	1
Switchman	1
Probation officer	1
Decorator	1
Lumberman	1
Chauffeur	1
Truck driver	1
Presser	1
Bricklayer	1
Electrician	1
Packer	1
Shoeshiner	1
Upholsterer	1
Real estate	1
Plasterer	1
Peddler	1
Leather cutter	1
Butcher	1
Candy maker	1
Horse-shoer	1

The most common occupation, as you see, was laborer, which is to be expected in a county hospital. The women of cancerous age were all housekeepers, as was also to be expected. There seems to have been nothing in occupation that predisposed them to cancer.

Type of Growth: The various cancers were reported from the laboratory as basal cell, squamous cell, epidermoid, epithelioma, rodent, simplex, bronchogenic, etc.—most of the qualifying terms applied to cancer having little importance.

Discussion: Occupation, heredity, alcohol, syphilis, and the social state seem to have little or nothing to do with the genesis of cancer. Injury seems to have had some effect in locating the tumor inasmuch as the tumor developed at the site of the injury and so soon afterward as to indicate a connection between the tumor and the injury.

Tobacco and a filthy mouth seem to have been the chief agents in starting the tumor and in deciding where it should be located.

I am convinced that cancer is the result of a slow biochemical action on the developing epithelial cells, that it may be caused by more than one thing, and that time is an essential part of it; a slow absorption of some chemical substance

into the blood and other fluids of the body that bathe the developing epithelial cells, or a slow physical action by sunlight, radium, or x-rays. It is more than possible that a slow absorption of mild toxins from the organisms developing in carious teeth, in root abscesses, and in pyorrhea, as well as developing in chronically infected tonsils, particularly in the patients who have carious teeth, pyorrhea, and infection of the tonsils, play a large part in the slow biochemical changes that start cancer. In fact, the whole process has a close resemblance to inflammation except that the process is not severe enough to cause chemotaxis, necrosis of cells, and the reaction that comes with inflammation. It seems to be more like the slow reaction going on in the formation of a gumma though even that is a more active process than the process that results in the development of cancer. The absorption of these mild toxins must go on for quite a number of years before they have sensitized the germinal epithelial cells to the point where a little added stimulation in the form of irritation inaugurates the cancerous proliferation that does not cease until the cancer is removed or the patient's death results.

This general stimulation of epithelial cells throughout the body explains why recurrences occur so often after apparently perfect removal of a cancer, and after several years. The sensitization is general and the cancer is only a local manifestation of a constitutional condition which needs but a little added stimulation almost anywhere in the body to cause a recurrence of the cancer there. This has been borne out by experiments on mice during the production of tar cancers. After the mouse had been painted with tar, and before cancer has appeared, scratches at a distance from the place of application of the tar have caused the cancer to appear at the site of the scratch before it appeared elsewhere.

In short, the production of cancer is very much like the process Loeb developed in his experimental production of artificial fertilization of sea urchin eggs. He changed the composition slightly of the sea water in which the unfertilized eggs lay, and they began to multiply, or he scratched their limiting membrane slightly and this slight trauma started them to multiplying. It does not seem irrational to suppose that a slight change in the composition of the fluids surrounding the germinal epithelial cells, combined with a slight trauma, might act in the same manner.

DISCUSSION

Dr. A. H. Andrews, Chicago: In cases of cancer of the ear, of which I have seen a few, it has been hard to trace or impossible to find any heredity, any family tendency or any predisposing cause that I was able to discover. I think that the question of local irritation has much more to do with the production of cancer than anything else we know of. Most of the patients I have had with cancer of the middle ear, have had long standing suppurative otitis media, and in cancer of the throat I think all of them had been tobacco users, with tonsils that had given evidence of disease long before the cancer appeared. Among patients with chronic suppurative otitis media, probably not one in ten thousand develops cancer; of smokers probably a far smaller percentage, so I cannot make much of that phase of the etiology.

Dr. Oscar C. Breitenbach, Waukegan: There are few clinicians, who have given more attention to a problem so important as that of cancer than has Dr. Boot in the field of otolaryngology. I want to compliment him on his enthusiasm.

Reasoning by analogy is dangerous. Those of you who have read the first Joseph Price lecture by Professor Warthin of the University of Michigan covering 1500 autopsies on subjects showing physiological evidences of latent or active syphilis, could not help but be impressed with the very selective tendency of lues. It does not follow that analogous parts in the male and female should show the same frequency of attack. In lues immunity in the female is shown particularly in the cardio-vascular system, central nervous system, and the ovary, but pathology is much more extensive in the liver, pancreas, adrenals, and lower bowel than in men. I am inclined to believe that we have a definite serological background in cancer as we have in syphilis.

Tissue repair is dependent upon the stimulation and inhibition, and in the normal individual cell reproduction ceases when anatomical defects have been restored. Chronic irritation in the cancer patient seems to lack the final stimulus of inhibition, and I concur in Dr. Boot's final conclusion that bio-chemistry in precipitating a faulty biological reaction may after all be a very important factor in this great problem.

Dr. Noah Schoolman, Chicago: In this connection I have come across what seems to me to be a very plausible theory propounded by Dr. Benjamin Gruskin, pathologist, Mount Sinai Hospital, Chicago. His conception is that connective tissue cells normally have the property of generating certain lysins which are antagonistic to the excessive growth of epithelial cells, so that although an inciting factor such as chronic irritation may be present carcinoma does not develop. If on the other hand the connective tissue fails to produce such lytic agent a carcinoma results when the proper extrinsic factors are present. The opposite cycle follows in the production of sarcoma. The tendency toward deficiency or lack of the lytic agent which is

responsible for the maintenance of tissue equilibrium is hereditary and relative. And the lower the threshhold of safety, the surer and easier will it be wiped out, particularly as age advances, by a chronic irritation. This theory is rather fascinating and seems to allot a proper valuation to the important and yet not quite understood role that heredity, age, and chronic irritation play in the production of malignant disease. Experiments with animal inoculations for the production of immunizing sera and their employment for the detection and treatment of cancer is described by this author in the *American Journal of the Medical Sciences*, April, 1929, No. 4, Vol. CLXXVII, p. 476.

Dr. George W. Boot, Chicago: (closing) In answer to Dr. Carmody, local irritation is not enough to cause cancer, or we would all have it from shaving. You say that not one in 10,000 smokers develops cancer; you say that most of these people have bad teeth; I grant it. The point is this; there is a cancer age, and there is something that sensitizes the cells. It is not one thing, it is several. Laborers are injured more about the face, but I doubt if they are injured more in other parts than women. Undoubtedly syphilis has something to do with it. As to Dr. Schoolman's theory that there is a barrier between connective tissue and epithelium, we will all grant that but something else acts on these epithetlial cells.

MODIFICATION OF THE PRESENT RADICAL OPERATION FOR DEFLECTION OF THE NASAL SEPTUM*

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It is the opinion of the writer, based upon clinical observations of more than twenty years, that the nose and its accessory sinuses, etc., have been and continue to be, perhaps, the objective of more vicious surgical attacks, than any other part of the human anatomy; hence we find the post-operative status of this class of cases is, in far too many cases, a worse condition than the pre-operative status.

The reasons for these unsatisfactory results following nose and sinus operations are obvious: First, that this is a field of operation that is most difficult. Second, that too many dare to invade this special domain of surgery with insufficient knowledge and skill of technic, regardless of its difficulties. This special surgery should be undertaken only by the well-trained specialist, and not by the novitiate; and emphasis should be placed upon the importance of the novitate first acquiring the proper skill and technic upon the cadaver before operating upon the living subject, which in many instances comes close to the border-line of criminality. As proof of the above statement, some years ago the writer was called as consultant in a case of traumatic meningitis, with fatal results. This was a direct result of a trauma to the cribiform plate, which occurred in what should have been a simple turbinectomy. Third, that in at least a small percentage of cases, even the expert operator fails to attain to the full measure of results desired.

There are cases of deflection of the septum in which it is preferable not to interfere surgically with the septum. There can be considerable deviation or deflection of the septum, and yet there may be no serious interruption of breathing or drainage. There are other cases where the convexity of the septum presses against hypertrophied turbinates, which blocks free breathing and drainage. This class of cases can be corrected by performing a simple turbinectomy.

A submucous operation on the septum alone will not correct pathological conditions of the nose and accessory sinuses which are caused by intrusions of the turbinates on the septum. We should bear in mind that a deflection of the septum (excepting cases caused by traumatism) has its origin in childhood.

M. Lubman in New York Medical Journal, Nov. 22, 1919, states that in his opinion far too many septums are sacrificed because they are not straight. A deflected septum per se does not require any operative intervention so long as the patient does not complain or show symptoms of obstructed breathing and drainage.

Pautow enumerates the various disadvantages of the Killian operation, which have led to an attempt to devise newer and less radical operations. "In the first place the septum, after the Killian operation, although straight, may be movable, being drawn against the side of the nose on inspiration. Second, the operation may also cause a falling in of the bridge of the nose. A third complication to be dreaded is perforation of the septum. Fourth, in atrophic rhinitis, or any latent tendency toward it, the Killian operation is contraindicated."

One of the attempts at greater conservatism has been the reimplantation of cartilage between the mucosal layers, with the hope that it might live. Animal experiments, however, have shown

*Read before the Section on Eye, Ear, Nose and Throat, Illinois State Medical Society, Peoria, May 22, 1929.

that such cartilage grafts do not live, but are absorbed.

The writer believes that the modern operative methods have a tendency toward too much radicalism; especially is this true as regards the nasal septum operations, like the Killian-Freer operation, and other operative procedures of like character, which have for their aim the removal of the major portion of the bony structure of the nasal septum. There is a very small percentage of deviated septums which can be corrected only by radical operation. In conditions of this character, the radical operation gives the best results obtainable; but in the vast majority of cases of deviation, the correction can be made by less radical methods, which have the advantage of conserving at least a bony skeleton or frame to support the septum; and therefore, except in the small percentage of cases above referred to, in which the Killian-Freer operation will render the best results to be secured by any method, the less experienced operator, especially, will secure better results by following the line of conservatism, as represented by the operative procedure or technic of Asch, Watson, Gleason, Roberts, Sluder, Kyle, etc., or combinations or modifications of them.

The writer has made use of the following operation for the past twenty years with good results. No claim is made that it is adaptable to all septum deviations, but that it is adaptable and gives good practical results in all classes of cases where there is a simple convexity of septum without large spurs or excrescences.

Technic: First thoroughly cleanse the nose by freely spraying with normal saline solution, then apply with pledgets of cotton a one-three thousandths solution of bichlorid of mercury to the entire mucosa of the nose.

Second. Complete anesthesia is produced by three grains of cocaine hydrochloride crystals placed in a small glass, and a cotton-tipped applicator wet with adrenaline solution is dipped into the crystals and applied to every part of the nasal mucosa. It is a good plan to follow the instructions of McKelvie, that is, to be particular to make the aplication to mucosa overlying the spheno-palatine ganglion, an area located just behind and above the posterior end of the middle turbinal.

Third. Roe's nasal septum forceps are applied to the deflected septum so that the male jaw of the forceps is directly over the crest or summit of the convexity, and the female jaw rests in the concavity on the opposite side of septum. Before applying the forceps to septum, a thin rubber sheet or pad is placed upon the septum, and care should be taken to see that it remains in place on each side between the jaws of forceps and mucosa. Sufficient pressure is used to fracture the septum and place the part over sufficiently well to give the desired space, and if necessary the forceps can be reset in order that sufficient area can be fractured and reflected to the concaved side.

Fourth. The nostril which was blocked is packed with Simpson's intra-nasal tampons, rolled in two per cent. yellow oxide of mercury ointment. This is left forty-eight hours. At each dressing the nose should be sprayed clean with some alkaline solution, and just enough packing used to keep the septum from deflecting. As a rule three full packings with Simpson's tampons will be all that is needed, as the fractured sections of bone and cartilage cement together rapidly.

If performed properly, there should be no tearing or breaking through of the mucosa, and no more surgical reaction from trauma than in a submucous operation. One advantage to be claimed for the operation is that it can be accomplished in a very brief time, as compared with the long tedious submucous operations.

The jaws or blades of forceps should be blunt and not sharp, as the area of convexity is not to be cut out, as with a sharp punch, but is to be only fractured and reflected to the concaved side, without cutting through the mucosal layers.

Infection following operation is less liable to occur than in a submucous operation, for the reason that if properly done there is no opening for an invasion.

DISCUSSION

Dr. C. Hopkins Long, Chicago: We all differ in our ideas concerning submucous operations, and we all have our trouble with deformities. I feel that every man has to deviate from the regular Killian operation according to the case. One thing we have difficulty with is closure of the wound. Very frequently forty-eight hours or so after the operation the patient returns with considerable pain in the field of operation. This usually means an infected wound. Opening the wound and inserting a small drain will relieve the condition. Perhaps had I always been as careful as Dr. Burkhardt I would not have had this annoyance. I

have not been in the habit of using antiseptics in the roof of the nose, as I have always considered that it was a sterile field. An operation on a nasal septum is said to have cured a patient's deafness. In my opinion there is only one kind of deafness that can be improved, and that is tubal deafness, an obstruction of the tubes. A sequence that frequently occurs after operations on the nasal septums is a tonsillitis which may appear as late as ten days after operation. It gives the operator a great deal of trouble, as he is usually inclined to think that the operation has had something to do with the trouble. However, an inquiry into the past history of the patient usually shows that he is subject to tonsillitis, and this is merely an exacerbation.

Dr. Oscar C. Breitenbach, Waukegan: The question of secondary pathology is most important. The essayist made mention of hypertrophied turbinates sometimes impinging on a deviated septum and doing a turbinectomy instead of a submucous operation in selected cases to establish free breathing. I am firmly convinced that a great deal of nasal pathology is definitely traceable to a deviated septum and the resulting disturbed nasal function. The nose definitely is an organ and has a definite function aside from smell—e. g. filtering, moistening, and by virtue of the dynamics involved in the air going through the nasal passages, aerating head cavities. A turbinate shows hypertrophy as a result of contiguous pathology, or is directly the result of deflected air currents as a result of the nasal septum being deviated. The deviated nasal septum is not only responsible for turbinate hypertrophy, but is the most important factor in a great deal of hyperemia inviting infection in the sinuses. I would be hesitant, therefore, in the face of a definite septal deviation to remove so important a physiological structure as a turbinate.

It is to be regretted that text-books on physiology fail to emphasize the importance of nasal function. Much is still hypothetical, but our knowledge through splendid research both in this country and abroad is definitely shaping itself.

Dr. C. H. Burkhardt, Effingham: (closing) It seems that according to the discussion here, that we are somewhat at sea in regard to the definite function of the nose. Evidently, the principal function of the nose is to take care of air, in other words, it is the organ of ingress and exit of air, which is warmed and strained before it enters the lungs. I think the principal thing to look after in regard to the nose is to see that we have free breathing and free drainage. If there is blocking of the drainage we will have trouble in the accessory sinuses. We know in all surgery the cardinal principle is to have proper drainage as early as possible, and that holds true in the nose. I do not include all cases, of course, but those noses in which you have a badly deflected septum, if you can get proper relief by removing a portion of the turbinate you get the desired result and probably a great deal better one, than by trying to operate on a septum that you may find is inoperable. There are septums in which a submucous operation is the operation of choice, but my experience has been in the majority of cases that the simple method of operation outlined in the paper is better than a long tedious submucous with the possibility of a poor after result. The operation I suggested is not adaptable to all cases, but with the majority of cases you will get beautiful results and your patient will be much better satisfied than by the submucous method.

KETOGENIC DIET IN EPILEPSY*

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Epilepsy constitutes an important public health problem. Conservative estimates by those in a position to investigate the incidence of epilepsy among drafted soldiers during the war indicate that five hundred thousand persons, or one in every two hundred and fifty persons in the United States, are afflicted with this disease. Despite the vast amount of work that has been done in this field and despite the abundance of reports on various abnormal functions of the body of an epileptic, it has as yet not been possible to demonstrate any definite cause for the occurrence of convulsions. Numerous arguments have been proposed to ascribe a chemical or metabolic basis for the convulsions and this is at the present time the outstanding thing. A few of them are given in references 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10. That many authors attribute epilepsy to a disturbance of the endocrine is evidenced by a few publications given in references 11, 12, 13 and 14. Others are in favor of the theory of a purely uncomplicated cerebral and nervous involvement. References 15, 16 and 17.

Since we have not been able even to ascertain the role which endogenous or exogenous factors play in the causation of that disease, there is a certain justification in following up mere conjectures to prove their merits or demerits. The fact that fasting causes a cessation of convulsions was brought out by the conjecture of an osteopath in Michigan in 1921. A few physicians substantiated his findings and proceeded to study the changes in the body produced during starvation. During fasting a definite reduction in the alkali reserve of the blood is produced there is a decrease in blood sugar, an increase in the hydrogen ion concentration of the blood.

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In the urine an increase in uric acid as well as an increased total titrable acidity and an increase in the excretion of ammonia. Since fasting can be only a temporary treatment and since it was found that after a starvation period convulsions again appeared, Wilder, Petermann, Talbot and others worked out a diet calculated to produce changes in the body similar to starvation. This was the beginning of the ketogenic diet.

In administering the ketogenic diet the patient is given a normal amount of protein, according to his body weight, a much reduced quantity of carbohydrates and an excess of fats. The human organism is unable to oxidize fatty acids completely to carbon dioxide and water unless there is an accompanying oxidation of glucose. If the amount of carbohydrates is reduced, intermediary products of fat digestion are formed belonging to the acetone group which have a highly acid reaction. It is thought that this production of acid during digestion is the essential thing in obtaining results. Wilder, however, ascribes the action to the anesthetic effect of the acetone bodies upon the nervous system (reference 20). Others explain the action of the ketogenic diet upon the basis of a dehydration process produced by the laxative and diuretic effect of the diet. The patients generally lose a few pounds in weight during the first two weeks of diet on account of loss of water. It must not be overlooked, however, that one reason for the effect of the ketogenic diet upon the convulsions may be a detoxifying process during the digestion. The appearance of the patient while under the treatment suggests the latter. Much has been said in favor of the ketogenic diet as well as against it. It cannot be denied that in this method of treatment we have for the first time found a way to influence epileptic convulsions without the use of depressive drugs.

Our work was carried on with eighty female epileptic adults all located in one cottage at the Chicago State Hospital. Of these eighty patients, 10 were young adults with pure idiopathic epilepsy and only little mental deterioration; 18 were old women, who had been inmates of the institution for many years and were not very suitable for any kind of treatment any more. The remaining 52 were cases of idiopathic epilepsy and cases of organic brain disease with epilepsy. We started treatment on all of them to avoid any impression of favoritism.

A physical examination and a complete urine analysis were done on all patients. Many of the urine specimens revealed abnormal findings. The most common was a persistent very low specific gravity ranging from 1001 to 1003. Thirty specimens showed traces of albumin and casts. Most of the specimens had indican. The total acidity was variable.

After the preliminary physical examination of the patients the high fat diet was gradually introduced. All patients were kept under close observation and the effect of the diet upon them was noted. We soon decided to take off the diet, those patients with kidney lesions, those who were markedly underweight or who were in a poor physical condition generally. Four patients had developed pneumonia within a month after the introduction of the diet and although we reasoned that this may have developed without the diet we considered them poor physical risks and did not take them on again. Several patients with renal involvement showed an increase in albumin and casts and were also excluded from the diet. Gradually we also took off patients with a sufficient degree of mental deterioration to make cooperation impossible and a few of those who did not wish to cooperate. In this way the number of patients suitable for the diet had been gradually reduced to about thirty.

For each individual patient the diet was adjusted twice a week according to a gain or loss in weight. The urines were tested daily for acetone and diacetic acid. The patients' weights were taken twice a week.

The reaction to the diet differed greatly in our patients. One group did not develop ketosis in spite of a highly restricted diet, but some of these nevertheless showed very definite improvement in their condition. One young woman especially, who had been subject to several seizures daily was entirely free from them for three or four weeks at a time, although the urine showed only traces of acetone and no diacetic acid and the total acidity was very low. Another group of patients surrendered to a state of ketosis within only a moderately restricted diet; practically all of those were improved. A third group needed a well restricted diet but could be kept steadily in acidosis. The degree of improvement of this group corresponded di-

rectly with the amount of acetone and diacetic acid in the urine. The total acidity of the urine, however, was of no importance in any of these cases. A fourth group showed no improvement although they were in ketosis for over two months. About nine patients under treatment belonged to this group.

Since our results were so variable we thought that the tests for diacetic acid and acetone in the urine might not be sufficiently sensitive to estimate the effect on the diet. The carbon dioxide tension of alveolar air was introduced. These tests were performed several days on every patient who according to the urinary findings were in acidosis, but only one of them had a normal percentage of carbon dioxide tension. All the rest of them had a marked shift to the alkaline side. The readings varied a good deal in the same patient during the day but never reached the normal.

Results—One patient, a woman forty-five years of age who has had convulsions daily since infancy but showed very little mental deterioration, was easily influenced by the diet. She was in a much better physical condition as evidenced by a clearer complexion, a clean tongue, bright eyes and a more elastic walk. Her interest in her environment was much greater. While in ketosis she had convulsions only about once a month.

A second patient who was subject to major as well as minor attacks of epilepsy every day had only one or two convulsions a month while under the diet. The peculiar thing in her case was the prompt reaction to the diet. Even though no ketosis was produced as far as the urinary findings were concerned. The total acidity of her urine was only slightly acid at all times.

A third patient of special interest was a young woman about twenty-seven years of age who had from two to twenty-seven attacks a day but very little mental deterioration. As soon as she was in a moderate ketosis her convulsions decreased in number and severity and she was entirely free from attacks for seven to ten days at a time. Unfortunately she broke the diet now and then, which always resulted in a large number of convulsions.

Practically all of the other patients with the exception of a few were physically improved and the number and severity of the attacks decreased. One patient I like to mention was a young woman twenty-five years of age with a very good education who had filled quite a responsible position a few years ago. Her disease started with psychic phenomena largely of a sexual nature and typical epileptic convulsions developed gradually out of this condition. This is the only patient who was kept in a definite acidosis with regard to urinary findings and also with regard to the carbon dioxide tension test, but yet there was no change in the number or severity of her convulsions.

In concluding this report I wish to state that in the ketogenic diet as it is used at present we do not have a cure for all cases of epilepsy (many are benefited by it), but we have a method to influence the convulsions without depressing drugs—and in it we have at least found a basis for a new direction in research in that disease.

1819 West Polk Street.

DISCUSSION

Dr. S. M. Goldberger, Chicago: I agree with everything Dr. Saunders has said about the ketogenic diet, and I am glad one man is here to substantiate whatever I say, and that is Dr. Wiley.

Dr. Wiley referred a case of epilepsy to me some time ago. This was a child about ten or eleven years of age. The child had twenty to thirty convulsions every morning. The only history obtainable was that the grandmother on one side had had epilepsy at the age of forty-five. Otherwise the family history was negative.

We started the case by putting it on the starvation diet for five or six days and then gradually increased the ketogenic diet. Within a period of two weeks our seizures amounted to one or two a day and by the end of the sixth week we had no seizures at all in this patient.

But a peculiar thing happened: just about the time we were to discharge the patient, he developed a pain in the McBurney's point, and I made the diagnosis of appendicitis.

I called up Dr. Wiley and told him I thought his patient had appendicitis. The patient was all the time under a high degree of acidosis. The boy was operated on and a pus appendix was removed. He made an uneventful recovery in ten days, was taken home, and everything went along fine until one day the mother called up and said the boy had had a number of convulsions.

I said, "What has he eaten?"

She said, "He told me he ran away and got a couple of boxes of chocolate cigars, which he had eaten."

He had increased the carbohydrate intake and the convulsions started. I told her to go back to the diet he was first put on, and in two or three days the convulsions ceased. This was about a year and a half

ago. Up to the present time the boy has two or three convulsions a month.

This is the only case that I know of in the literature where a person or a child has been operated on during the extreme degree of acidosis. So it shows you that in this type of case, acidosis is not a hindrance to an operation.

At the University of Illinois where I have been doing this work, we have found that environment often makes quite a diffierence; that placing any of these patients in a different environment causes the convulsions to cease, and just as soon as they become acclimated to the environment the convulsions begin. Therefore, in private cases it is rather a costly procedure, especially if it has to be hospitalized and the hospital treatment is the only treatment that can be carried on in this line of work.

Another thing that I wish to place emphasis on is that this treatment can only be used in the idiopathic form of epilepsy. No form of epilepsy that is of organic origin will be helped by the treatment, and it is well to bear this in mind because we save a lot of expense and hard work if we do so.

So often we get a case that we think is amenable to the treatment and we find out that instead of it being an idiopathic case, is a case of encephalitis. Here we get no results at all, and also the longer duration of the idiopathic type of case the less the chance of recovery, due to the mental deterioration.

I am very glad to hear Dr. Saunders' paper because it is not more than four-five years ago that the branch of the Chicago Medical Society to which I belong met at the Chicago State Hospital, and at that time I asked those who were taking care of the epilepsy patients whether they had ever used the ketogenic diet. I am glad that the doctor has told us what good has been done since using this line of treatment in cases of epilepsy.

Dr. Charles R. Wiley, Chicago: I can bear out and substantiate the things said by Dr. Goldberger on the case which I referred to him. This case, so far as I know, is practically entirely well. That is, they consider him well when he is having only one or two attacks a month. But I will bear this out, it was a very long, tedious and expensive procedure. It can only be carried out by people well equipped with money.

I wonder if these men have tried this ketogenic diet in the migraine which seems to be so closely associated to idiopathic epilepsy.

Since Dr. Goldberger treated this case of mine I have used it in a number of cases in migraine, and it seems to me they have shown some improvement. You all know, in migraine you haven't much to offer people. I have put these people on a diet producing acetone, which is a fairly simple procedure, and they have been able to go along without these periodic headaches for some time. I think that every case of epilepsy ought to be inspected frequently for possibilities of the ketogenic treatment. These men and women who are developing this method undoubtedly will do a great deal of good for cases of epilepsy.

Dr. R. O. Stites. Industry: I am so ignorant would you please, explain just a little, what the ketogenic diet is? I came in late.

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THE SO-CALLED TRAUMATIC NEUROSIS*

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In 1867 John Erichsen, English surgeon, published his famous monograph *Railway and Other Injuries of the Nervous System.* In those days it was customary to use a motto under the title and for this work Erichsen curiously enough chose the words of Montaigne: "I relate; I do not pass judgment," after which pronouncement he proceeded to describe various symptoms arising after railway accidents, and to pass judgment upon all manner of symptom complexes ranging from those of complete division of the spinal cord to those portraying what are now known as traumatic or reimbursement neuroses. Quite ignoring the intent of his motto

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he assures the reader that the basic pathology is doubtless that of a chronic meningo-myelitis, apparently basing his very general conclusions upon a single autopsy.

Thus arose the famous conception of the *railway spine*—the first formulation of the traumatic neurosis. In Erichsen's day neurological diagnosis was not so dependent upon objective findings as nowadays. Hysteria was known, but not its mechanism; and Babinski had not yet discovered the famous reflex of the big toe. The Wassermann test, spinal puncture and the x-ray were still in the distant future. Erichsen recovered large damages for his clients and started a controversy which lasted until the present day.

Oppenheim in his text-book of neurology, published in 1911, paid tribute to the persisting influence of the English surgeon in a statement that "accidents in which a physical trauma is associated with a mental shock, as in railway accidents, are especially liable to produce this neurosis—indeed have been the main source of our knowledge of traumatic neuroses." Oppenheim was inclined to relate the symptoms to "molecular changes, the result of concussion, in areas of the central nervous system which control the higher mental functions and the motor and sensory activities related to them." However, he conscientiously referred to a number of authorities, notably Strümpell, who differed from his views, even at that time holding that the desire for reimbursement was the most important if not the chief cause of neurosis.

A few years after this came the World War with its tremendous production of the neuroses labeled *shell-shock*, now so familiar to all. During the war the neuro-psychiatrist became thoroughly acquainted with the relationship of certain bodily symptoms to the individuals' intense desire to escape from an intolerable situation; when the war was over he saw thousands quickly recover, and since then has observed the persistence of neurotic reactions in many ex-service men who prefer government compensation to the vicissitudes of competitive existence.

Since the war nervous disturbances following industrial accidents and unaccompanied by objective findings have come to be looked upon with increasing frequency as functional, the effect upon the body mechanism of the individuals' wish to be sick. Especially does this seem to be the view of German writers who eye askance their system of indeterminate pensions under which *92%* of the neuroses remain permanent as compared with the speedy settlement plan of Denmark, where only a trifle over *6%* persist after the award (O. J. Fay).[1] Oppenheim's 1923 text, revised by an editorial board of his old associates, pays little attention to his old viewpoint as contrasted with that of Strümpell's more recent followers. Stier[2] states quite simply that everything beyond the reaction to the accident, such as is observed in the uninsured, is either unrelated to the accident or is a reaction to the expectation of compensation or damages. The amount of conscious simulation he feels is not important—curiously agreeing in this with the English officer who told a friend of the writer that in their war hospitals they made no especial effort to discover malingering, though very possibly they treated some patients less gently than others because their symptoms semed to be more consciously assumed.

M. Reichardt,[3] who has written extensively upon the subject, insists that "Mental reactions are not illnesses which accompany disease processes" and "—in my opinion it is false to call a traumatic neurotic sick, and a traumatic neurosis a disease—the accident neurosis is neither a neurosis in the sense of a disease, nor is it the consequence of an accident, but the psychological outcome of the traumatic experience or the brooding over it." Reichardt goes on to recite well known facts supporting his contention, namely: that children, students, sportmen and housewives do not acquire neuroses under similar conditions to those precipiating these reactions in compensation seekers; that severely wounded soldiers were exempt, also prisoners; that lightning stroke with its terrific shock does not induce neurosis, that those badly injured by accident do not develop it, nor traumatic epileptics; that a neurosis often develops as the actual injuries heal; and finally, that payment of the claim cures the patient.

Kleist[4] believes that "There are no traumatic neuroses, but only compensation neuroses," calling attention to the fact that (in Germany) private insurance companies pay only in cases of mental and nervous disturbance dependent upon organic disease of the nervous system. Government insurance holds that if the disability arises

from the workman's imagining himself to be sick, more or less consciously, the accident is not the cause of the disability. This ruling is apparently in line with that of our own courts and industrial boards—the difficulty lies naturally in determining just how conscious of his wish-to-be-sick the claimant really is.

It may be well here to quote briefly the case of Julius Z—as a paradigm of those in question.

Julius was brought to the writer's office by a company official who seemed thoroughly of the opinion that the man was in a very serious condition. Z—was a Pole, aged 37, married with seven children. He had suffered a rather slight head injury not involving loss of consciousness, some months previously. Complaints had developed gradually, and especially after a herniotomy, mistakenly undertaken during the neurosis.

He was a miserable object, depressed and exceedingly hypochondriacal. He said he felt "no good," his head was "too sore," he was deaf in the right ear and there were sounds "like running water and whistles" in his head. He had pains in the head and back at times, and the seat of operation "cracked" when he bent over. When he read his eyes blurred and after treatment by an ear specialist (inflation?) his body felt "all swelled up." He felt weak and stayed at home all the time because his head felt "sore" when he went out of doors. At night his wife stated he slept poorly and roamed about the house.

Neurological examination was negative for objective findings. There was alleged tenderness to percussion over the left occipital region and he refused to bend over to pick a coin off the floor because his back was sore. Though he walked well and cooperated well in tests for muscle power in the upper extremities he made a great fuss over lifting the legs from the examining table against resistance—a common finding in such cases.

Conclusions in the case ran in part as follows: "The tendency to develop these conditions after accidents seems to be inherent in certain men. Whether the man is looking for compensation I can not say, but the idea is quite universal with men who are hurt nowadays while at work. Z—is not permanently disabled and for his own sake should be told that he can get well in a short time and go back to work. It is very easy to make a baby out of the patient in a case like this; in fact the most of them are so inclined to begin with."

A year later the company stated that Julius had been back at work for three months. Shortly after the above examination they paid him a thousand dollars and he recovered, purchased an automobile and was very happy, according to his wife's statement.

The writer has reviewed some thirty of his cases in which a diagnosis of compensation or damages "neurosis" seemed most probable, no attempt being made to analyze the group statistically. Among the most marked cases were several women, one of whom, after two years of self-imposed invalidism and a final appearance in court upon a stretcher, has recently received by a compromise settlement a very handsome sum from a transportation company. A few months later she was reported to be getting about with a cane and in very good spirits because she was "well fixed for life." Her great chance came to her in her forties and after she had played a lone hand as a widow and nurse for many years. Who can say just how consciously she seized upon the opportunity? Another woman of the hypochrondriacal-depressive type was a forlorn little middle-aged seamstress, separated from her husband and distressed by a disfiguring birthmark for the treatment of which she had come to Chicago shortly before she was moderately shaken up in a transportation accident.

The ages ranged from 19 to 59 years and the majority were laborers, with a sprinkling of clerks, carpenters, butchers, mechanics, bakers, etc. Only a few were single. Along with an added sense of responsibility, the desire for sympathy and appreciation no doubt plays a considerable role in the production and continuation of these conditions in married wage earners. The wife, if she accepts the man's illness as real—and why should she not?—must fear for her future and that of her children, thus reinforcing and adding to her husband's anxiety.

The injuries were, for the most part, falls or blows upon the head, occasionally the back, or an extremity. Unconsciousness was said to have occurred in about fifty per cent., but seemed to bear no particular relationship to the severity of the complaints. In fact one of the worst invalids had merely been struck upon the head by the toppling over of a heavy chair frame without resultant loss of consciousness or skull fracture. His complaints of headache, dizziness, weakness, loss of memory, poor sleep, etc., continued unabated until he received a few hundred dollars in settlement, after which he made a good recovery. X-ray evidence of skull fracture existed in a few and then was only linear in character. In a number of instances the em-

ployе evidenced resentment over the attitude of company doctors at the time of the accident and the care given, a state of mind which no doubt contributed to the development of the persistent complaints.

Head sensations were commonly headache and dizziness, the latter especially upon stooping over; commonly the two went together, but occasionally separately. Numbness, soreness, pressure and pains in the neck were also mentioned.

More general complaints were of forgetfulness, inability to concentrate, poor sleep, depression, weakness, fatigability, blurring of vision, loss of sexual desire and irritability. Two men asserted loss of the use of an arm, but both were quite plainly malingerers, that is, their wish-to-be sick was a conscious one.

Careful neurological examination developed no objective evidence of organic lesion of the nervous system. Muscle power was often poorly exerted and inconsistently, against resistance, although in general the subject cooperated well. Coordination tests were sometimes poorly done with the upper extremities, but the degree of failure to approximate was always the same and usually in the same direction. Corneal and faucial reflexes were absent in only two cases, anesthesia of the extremities was uncommon and never found in the hysterical form of stocking or glove loss of sensation. In the case of Tony M—, a dull appearing Pole, right sided hemianesthesia developed during examination; he denied all sensation upon this side but when told to say "No" whenever he did not feel touch or pin-prick (with his eyes closed) he did so very conscientiously. Tony had had no head injury but claimed loss of use of the right hand following a fall, and in spite of a statement that he was malingering the company contemplated settling the case upon a basis of 50% disability until it was discovered that he was carrying more accident insurance than his wages amounted to. Tremors were frequent though rarely marked. Profuse axillary sweating and dermographia were noted at times and tenderness of the cranium or cervical spine to percussion was frequently claimed.

However, though careful routine neurological examination, including scrutiny of the optic nerve heads, may fail to reveal evidence of organic lesions in head-trauma cases, the possibility of their existence is not to be ignored. Many writers look upon neurotic complaints following head injury as due to organic changes resultant upon concussion, and many explanations of its effect upon the brain substance have been offered. Thus years ago Obersteiner and Oppenheim adopted Erichensen's vague theory of *molecular change,* while later on Trotter laid the blame upon cerebral anaemia produced by the blow. Mott[5] and Cassasa[6] along with many others, have regarded capillary hemorrhages with their consecutive phenomena as the cause of intracranial pressure. McLaire[7] has suggested irritation of the spinal fluid secretory mechanism together with delayed absorption, while Tillman believes that concussion may cause minute tears due to the varying response of white and gray matter and blood vessels, each with a different specific gravity and degree of inertia.

Following the lead of other investigators Ingvar[8] centrifuged the brains of frogs and mice in their skulls and found that intracellular changes resulted, concluding from this research that "the traumatic endocellular displacements demonstrated in these experiments can not be considered to be unrelated to the genesis of many of the symptoms of the traumatic neuroses." Hassin[9] at about the same time—1923—convinced himself that definite histo-pathologic changes, softening and secondary degeneration, followed concussion of the spinal cord in a case presenting the clinical picture of amyotrophic lateral sclerosis.

Osnato and Giliberti[10] in 1927 compared the microscopic changes in a case of concussion with those exhibited in encephalitis lethargica, also tabulating the relative frequency of various symptoms and complaints with rather striking results. In such patients as complain of headache, dizziness, tinnitus, blurred vision, sleep disturbance and fatigability following even an apparently slight head injury the authors emphasize the necessity of determining the fields of vision—which may contract before papilledema sets in; of investigating the reaction of the vertical canals to caloric tests—failure points to organic mischief; and of inquiry into the possible presence of nystagmus along with dizziness upon change of posture. Complaints associated

with these findings they believe indicate what they term *traumatic encephalitis.*

Leopold Heidrich,[11] has recently reported cases of apparent traumatic neurosis beginning six months to a year after head injury involving loss of consciousness, with the customary complaints of headache, dizziness, spots before the eyes, sleeplessness, fatigability, emotionalism, forgetfulness, and loss of ambition. Neurological examination failed to reveal focal signs, but the spinal fluid pressure was found to be greatly increased (rarely increased cells or globulin content), encephalography revealed evidence of serous meningitis, and the absorption of sub-arachnoid injections of sodium iodide was considerably delayed. H. Claude[12] cites 22 cases with skull fracture in which complaints were relieved by lumbar puncture, and Penfield[13] has recently called attention to the unexpected relief of headache and dizziness in a few patients following the injection of air for encephalography, citing the suggestion of Foerster, Schwab and others that serous inflammation of the arachnoid with cyst formation may cause the symptoms.

Unfortunately the seeker after reimbursement is proverbially suspicious and suggestible so that diagnostic and therapeutic procedures are often difficult to carry out and quite apt to aggravate complaints—*vide* the case cited of Julius Z.—following Eustachian tube inflation and herniotomy. It is well to consider all of the etiologic probabilities in any given case, yet it is obviously improper, where an ordinary neurological examination is negative, to diagnose intracranial involvement without confirmatory evidence along the lines suggested by Heidrich, Osnato and Giliberti, and others.

Effort has been made to obtain a check-up on many cases after settlement, but aside from a few—typical examples, however—this has not been successful owing to the peculiar circumstances involved. The mass of evidence accumulated by others, however, goes to show that the only successful treatment in a high percentage (vide Denmark as cited above) of cases is settlement of the claim. The wish-to-be-sick, thus deprived of its objective, disappears and recovery ensues. Since juries and industrial boards persist in discriminating between malingering and hysterical reactions when awarding damages or compensation, differentiating tests are highly desirable, tests which can be used as confidently as are those for feeble-mindedness. Unfortunately these are often quite impossible because there is no objective disability and no desire to cooperate in any procedure which may invalidate the subject's claim. Of course when a definite function is said to be lost or impaired, such as hearing, sight, sensation, power, etc., organic lesion can be ruled out, but the question may still remain as to the conscious or unconscious manufacture of symptoms. Observation of the subject when off guard is of course the best of all tests; and next to this as complete a mental inquiry as is possible under the guise of an investigation into the circumstances surrounding the accident and the present conditions—such research as is possible to determine personal make-up, character of family relationships, past reverses, unsatisfied desires, etc. Some information along these lines can be obtained during the preliminary interview, still more during the physical examination, and additional data when the latter is completed and the patient, who has dreaded the ordeal, is relaxed and loquacious.

Thus, when a man who has worked only three days for a company before receiving a minor injury reveals the fact that he has a small farm in Florida where he has left his wife in order to seek employment up North because they must have money for the necessary improvements, we have a clue to the real cause for his complaints —the wish to make capital out of a lucky accident. Perhaps he is simply a malingerer. But what of the man of fifty (with a young wife and baby) who acknowledges during a conversation about his injury that he has known for some time that he can not go on much longer at heavy work? He would like to set up a little shop of his own if he only had the money. This man will probably not feign illness, but the wish-to-be-sick is there and operative just the same. Neurosis and malingering are too often only different names for the same phenomenon — the translation of a mental state into physical symptoms.

Conclusions: 1. The long continued complaints of the great majority of post traumatic patients without neurological findings arise out of the wish-to-be-sick.

2. Similarity of symptoms and complaints, is probably due in non-organic cases to a persist-

ing recollection of disagreeable sensations directly following the accident, plus suggestion.

3. Medically speaking, it makes small difference whether the wish-to-be-sick operates consciously or unconsciously, since no hard and fast line can be drawn between these mechanisms working to a single end—self-preservation.

4. Courts and industrial boards, however, view the matter otherwise and recognize the so-called neurosis as a disability, whereas conscious simulation is summarily dealt with.

5. No rule of thumb can be used to differentiate these states of mind, but careful survey of the case as a whole will often reveal the desire-for-reimbursement motive.

6. Every effort should be made to rule out the possibility of organic lesion when head trauma has been accompanied by loss of consciousness, especially where complaints are limited to headache and dizziness. If, however, the patient will not submit to such tests as Heidrich and others suggest and a careful neurological examination reveals nothing, intra-cellular changes, capillary hemorrhages into the brain substance, meningeal hemorrhage, or serous, adhesive meningitis can not well be assumed to exist to explain the condition.

7. The workingman's compensation acts are humane and economically right. The development of the wish-to-be-sick reaction is a part of the price to be paid for their operation, human nature being as it is.

8. Considerate treatment of injured employes medically and by way of wage adjustments tends to prevent or modify emotional reaction to trauma.

9. In the absence of organic findings settlement of the case after a reasonable period of medical care and observation is rational treatment—but unfortunately too often impossible on account of meddlesome friends and lawyers.

10. More actual research into post traumatic nervous conditions is required, more thorough investigation of hospitalized patients, further efforts at treatment and last but not least, a systematic follow-up carried out over a period of years, especially of compensation cases following settlement. Casualty insurance companies can do these things if they will, and eventually such an inquiry could not but be beneficial to insurer and insured, while our medical horizon in this direction would be considerably enlarged.

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HOW WE RESIST DISEASE*

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Do we resist disease?

We do not, as probably only one person in many thousand terminates life by the unassisted route of senility. Then again arises the question as to whether senility itself is not a terminal state resulting from a lifelong combat between the forces developed to maintain life and the outside forces which are always seeking to cripple or terminate it. Probably at present the most widely accepted scientific thought is that germ plasm is immortal, (Weismann's theory). At the moment of fertilization an energy charge is set in action that first develops, and then in time begins weakening with old age as the inevitable. This energy charge is renewed from generation to generation. Be this as it may, nature has evolved life along the line: Eventually death, but delayed as long as possible, long enough at least to reproduce for perpetuation. In seeking a title for this paper my first thought was, "How Life Is Maintained." This would lead to an unrestricted study of physiology, physiochemistry, hygiene, etc., in addition to my real purpose, i. e. treating of the manner of the bodily reaction to the invasion of bacteria and other organic agents.

This phase of the natural phenomenon, life,

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can be understood only in the light of its evolution. There was a period when all life was unicellular. In an early geologic period certain strains acquired by means of cholorophyl and sunlight the power to store carbohydrates. These were the forerunners of plant life. Other strains developed the power to seek and absorb that which the first class had created and stored. These were the beginning of animal life. Plant life eventually evolved to where we have our many valuable food plants, etc., while animal life became more and more complex in its structure, but always living on the previously stored food stuffs. Plant life became immobile and so far as possible insensible to outer stimuli by protecting its surface with cellulose in the form of bark and other coverings. Chlorophyl gave it power to extract in excess of a living, sustenance from the inert, inorganic elements. The animal always seeking food, was ever increasing in sensibility and mobility and responding more and more to outer stimuli, and developed that most wonderful of all of nature's products, the nervous system, that goes between sensation and volition. Sensibility in time was followed by consciousness, which came into being when the animal was able to make a choice of two possible actions. Consciousness developed into intellect. First we thought to direct our actions, later developed the luxury of speculative thought. So man was first an artisan and very much later an artist. All this was built up by multiplying neurons and compounding reflexes. Man at the apex of animal life has this marvelous system at its best. So wonderfully has the nervous element developed that man can now contemplate his progress from the lowest to his present status.

Life always contending with the elements has evolved adaptation to varied circumstances. It is found sparsely in frigid areas and abundantly in the tropics and is maintained well up the mountain tops and in the depths of the ocean. This has not been gained without a struggle. Varying changes of temperature and moisture are but two of many circumstances limiting life, but other forms of life have constituted its greatest adversaries. Every species of plant or animal has its enemies in other species of plants and animals. It is outside the scope of this paper to even outline the relation of mankind to life in general. How the various forms of life are interdependent. As examples, how certain forms of bacteria play an important role for the good of mankind, and how necessary for the future is the return of dead organic bodies to the elements. "Earth to Earth and Dust to Dust was not written of the Soul," but it certainly is a necessity when we consider the dead bodies. Bacteria and the lower forms of animal life render this biologic service and dead organic matter does not long encumber the earth. In the light of science, how futile is the effort of our undertakers in preservation of the dead. Do all they can, nature will get them, and what does it really matter whether it is tomorrow or a century hence? It's nature's way, so take your turn. The dependency of one form of life on other forms is finely shown in the nitrogen cycle. Nitrogen is necessary for all life. Two and one-half per cent. of man's body is nitrogen. In the metabolic activity of protoplasm, this activity is the basis of life, the nitrogen compounds are broken down and eliminated from the cell in a form unsuited for further use of the animal organism. By bacterial action they are oxidized to the forms of mineral nitrates and the free nitrogen of the air. Green plants by aid of sunshine build again nitrogenous substances which are passed to man and animals. Plants are aided in extracting nitrogen from the air by a bacterial specialist, which attaches itself to a higher form of plant life furnishing nitrogen to it as the plants in their turn furnish carbon and nitrogen to animal life.

That which composes my body I have assembled from far and near. Parts came from the wheat fields of Kansas, from the cornfields of Illinois, the gardens of our truck men, the oyster beds of the Chesapeake, the tropics of Central America, etc. A few centuries ago certain portions of my present make-up were probably chasing other portions of it across the plains and over the hills in the form of a red man seeking the meat of a deer or a buffalo. The carbohydrates in the bananas I ate today possibly may have energized a monkey as he shinned up a cocoanut tree.

The carbon dioxide which the animal kingdom exhales at each expiration will next year

be builded into the potato crop and bloom of the flowers, while these and other forms of plant life will labor all the hours of the summer nights in order that the world's supply of oxygen may be maintained at near 21% of the atmosphere.

We cannot separate ourselves from our surroundings, the great God Nature has tied us hand and foot to all organic and inorganic matter. But that which should content us is that the human species has always a little more than held its own. In preliterary times it slowly gained. Like all other species it sharpened its wits in order to survive. Previous to the time of tradition and written records there was history left in rocks to be read. Science is gradually tracing our beginning farther and farther into the remote past by slowly turning and reading these pages of the geologic eras. The fact stands out clearly that our species became more and more the master of the situation. It contended more or less successfully with the adversities of the elements, and the larger and stronger species proved no match to the ingenuity developed by *Homo sapiens*. Man's ability to make and use tools completed his mastery.

The members of the Medical Profession feel pride in keeping constantly in touch with the sources of science in order to relieve suffering and prolong life. When we are frank and truthful, we say we can only aid nature, and modestly, as the great Ambrose Para said, "I dressed their wounds and God healed them."

Do we not suspect that within the next five years some member of our organization is going to succumb to a living organism that needs to be magnified one thousand times to become handily visible. These subvisible organisms are our constant companions, but only occasionally are things just right for them to strike a telling blow. When one does strike a co-worker, there will be much consultation and endeavor on the part of the medical fraternity, and let us hope that wisdom will ride in the seat and only means to aid nature will be used. In order that we aid nature we must first understand how nature works for the preservation of our lives. Let us study some of these means.

A brief summary of the history of medicine would be a fitting introduction to this subject. It would provide a setting for relative development of the art of medicine and later the scientific facts which make the practice of medicine the thing that it now is. The relating of this history I must forego because of time. At best this paper is but a partial presentation of the facts which give medicine its scientific basis. We do not belittle the art of our practice. Often the physician is financially successful in the degree of his accomplishment in these arts. Do you remember a doctor with the professional air that was worth as much as knowledge? How about the old fib of being busy night and day, told to intelligent people who were made to believe it? How about the solemn look, the cheerful word of encouragement? Are they not all in the art? I remember an old type physician whose presence made redolent the air with a distinctive odor. A patient of his always got better, so she said, when he came in the room "and she got a smell of him." To me it was nauseous. Another proof of the adage: "What is one's meat is another's poison."

How nearly scientific is this psychology has been shown in recent years. The future may make clear many now apparently queer and obscure phenomena.

Beginning in the seventeenth century pathological anatomy became the frame work for grouping diseases. Previous to this time, there had been a shifting classification. But the structural interpretation of disease gave more tangibility than any plan previously proposed. This method reached its fullest development under Virchow in the nineteenth century. While these studies were informative they never fully satisfied the physician in his struggle with disease. The dead house yielded nothing but disease in its static aspect. The great desire was to understand disease processes in their initial, intermediate and dynamic phases. This could not be done by studying only the dead tissue. This desire has in part been satisfied by the discovery of bacteria. Bacteriology has given to medicine its greatest single body of facts, while its study along with immunology and the biochemistry of metabolism has made disease more understandable.

Animate agents produce fifty per cent. of all diseases, while one-half of all deaths result from these causes. The list of diseases caused by ani-

mate agents is gradually growing, and it has been said, "The cause of any disease is not definitely settled until its germ has been discovered." While these diseases are due to the entrance and multiplication of some microscopic plant or animal-bacterium, spirochet, fungus, mould or protozoon, the conditions they produce, the symptoms, result from the fact that they are exogenous agents of foreign protein. The foreign protein produces disease leading to death or in case of survival, the reaction changes of immunity or hypersusceptibility. These facts, numerous and as yet confusing, are grouped in the special science of immunology. What could be more interesting or vital than the manner and method that nature has devised to protect the health and lives of man and beast?

In their relation to the human body bacteria are beneficial, indifferent, or more or less injurious. Against the latter our bodies are protected in two ways, viz: resistance to their entrance and in case of failure to resist, destruction of the microorganisms. The principal paths of entrance are broken skin, respiratory tract, genital tract and the alimentary system. The unbroken skin is very resistant except to such parasites as the hook worm. Normally "the skin is inhabited but not infected." In case of the eyes, exposed to the dust in the air and contamination from soiled fingers, nature has provided a constant irrigation with a mildly germicidal fluid, tears. It has been said that all shed tears but the newborn and dying. This accounts in part for the large number of eye infections during the first few days of life. The respiratory tract under ordinary conditions can withstand the 300,000 bacteria daily taken into the lungs. Nowhere is shown the wonderful resistance of delicate epithelial cells so well as in the instance of the digestive tract. The mouth is alive with myriads of bacteria as shown over three centuries ago by Leuwenhoek. The colon is so good an incubator that one-third of the fecal matter is bacteria.

Even though bacteria get past these first barriers, infection may not result as they are often met by antagonistic substances that destroy them, or they find conditions unfavorable to their growth. Multiplication is necessary for infection. In case of infection they may be limited to a small area and are prevented from making further progress. Again the organism may be discharged into the blood streams (bacteremia). They may here escape from the protective blood antibodies and start various new foci (pyemia). Again they may multiply in the blood stream (septicemia).

That different bacteria have preferred channels of entry, the following experiments of Park will illustrate. Into the skin of certain animals were rubbed live bacteria of virulent streptococcus, typhoid and diphtheria. As a result the typhoid bacilli produced no lesion. The diphtheria produced but little, while the streptococcus in some instances resulted in a fatal blood poisoning. He placed them again on patches in the throat. The typhoid was again harmless, the streptococcus may or may not give a sore throat, while the diphtheria gave its characteristic symptoms. The three were passed into the intestines, and the diphtheria and streptococcus were harmless, while typhoid developed from the other.

The results of a bacterial invasion depend upon the number and virulency of the organisms and the sufficiency, or otherwise, of the bodily protective functions. Immunity is the physical state enabling a body to resist an infectious disease, also the recovery from such a disease if contracted depends on the bodily power to create this immunity. If such immunity results from the bodily resources it is an active immunity; if from the administration of a drug or foreign material, it is a passive immunity. Examples of passive immunity are quinine in malaria and anti-toxin in diphtheria.

Bacteria affect the body in many different ways, but the three most important of the effects are: 1. destruction of bodily cells or tissues, 2. formation of toxins, and 3. formation of poisonous split proteins. The method of the destruction of cells and tissues is not clear, but in addition to the direct action of the toxins there may be a specific enzyme which actually disintegrates the body cells and tissues. The toxins are formed inside the bacteria and are excreted by them. These toxins pass directly into the surrounding tissues, damaging them, or are absorbed into the blood stream being car-

ried to more distant tissue where the injurious effects are noted. In case of tetanus and botulism, the nerves absorb the toxins.

The two effects (destruction of tissues and toxins), described above are true of but few of the ordinary human diseases. With a majority of the pathogenic bacteria the injurious effects are due to a different cause. Ordinarily bacteria multiply in great numbers before the bodily defenses are raised to the point where they gain control of the situation. When they do, the bacteria are killed and disintegrated. During this disintegration many substances are split off and set free which are irritating and poisonous to the various tissues of the body. These split proteins, formerly called "endotoxins," vary in their selection of the tissues they affect? These effects are the symptoms of the disease. The physician can frequently determine the infecting agent by the tissues involved. Recent investigation indicated that these split-proteins may be obtained from ordinary food protein (eggs, milk) by treatment with acids, alcohol, etc.

There is a fourth way in which bacteria are contributing to disease. Protein food in preparation or in storage may be partially digested by bacteria and ptomaines formed, many of which are harmless, while others are very poisonous. In order to distinguish between toxins, split-proteins and ptomaines, the following comparison is made; (a) toxins are formed and excreted by living bacteria, ptomaines result from bacterial action on their food material, and have never been a part of their metabolism. Split-proteins appear only at the death and dissolution of the bacteria; (b) very few bacteria produce a true toxin, while any kind of bacteria at decomposition may result in poisonous split proteins; (c) toxins or poisonous split-proteins have never been reduced to chemical formulas while ptomaines are nitrogenous compounds of carbon and hydrogen with oxygen the fourth element in the most poisonous; (d) all the bacterial toxins are poisonous, while many of the ptomaines are not; (e) toxins stimulate the body to form anti-toxins with their resultant immunity, while such is not the case with split-proteins and ptomaines. These latter are eliminated from the system without lessening the susceptibility to a repetition of the poisoning in case they are again absorbed.

Bacteria are possessed, like all forms of life, with the desire for self-preservation. It is not expected that they are completely defenseless. They secrete a substance known as aggressins, the purpose of which is to counteract the various blood antibodies. These aggressins are insufficient in every instance where recovery of the patient occurs.

The normal body meets the attack of bacteria in two ways. It increases the white corpuscles, and creates special antibodies which circulate in the blood and lymph. The white cells are formed in the bone marrow and lymph glands. These same tissues largely form the antibodies with the spleen as a probable additional source. There are evidences that these antibodies may come from any of the bodily tissues.

As was stated, the effects of the bacteria are due to two causes: the toxins they produce, and certain poisonous substances released at their death. The bodily protective function responds to bacterial invasion in two main lines of defensive material: antitoxins to neutralize the toxins, and substances to destroy the bacteria or aid the white blood cells in their destruction. This latter is essential and final, while the antitoxin is necessary to protect the various functions while nature gathers sufficient force to annihilate the invading foe. It is important that the body responds promptly as the greater the multiplication of bacteria, the greater the amount of poisonous split-proteins there will be to be eliminated. Upon the amount of these poisons depends the severity of the symptoms, and the outcome of the disease—death or recovery. Among the many influences lowering the bodily resistance are overwork, worry, fear, any type of nervous strain, lack of proper nourishment, either deficiency in quantity or quality, or improper digestion which leaves unsatisfied or unoccupied the cell affinities. This last gives opportunity for toxins or other bacterial products to unite with the cells with the resultant impairment of function.

The bodily cells, in common with all life, possess the power to absorb certain substances which are required for their support and growth. This selective power is an individual

matter with each type of cell. Various kinds of cells require various substances. This variety is supplied by the food in a mixed diet. Bacteria produce substances which may have the same combining power as the various nutritive substances. These may be absorbed by the cells and prove toxic, causing the cells to become irritated and to function poorly. While comparatively few bacteria produce toxins, their importance so far as danger to the human race is very great. Diphtheria, tetanus, gas gangrene, one type of dysentery (Shigás), botulism, etc. are the principle diseases in which toxins are responsible for the symptoms and danger.

Toxins are the most concentrated form of poisonous material. One cc of tetanus toxin is sufficient to kill 75,000 guinea pigs. One ounce of diphtheria toxin will kill 600,000 guinea pigs or 75,000 large dogs. It is for these deadly poisons that the body cells must respond with the neutralizing antitoxins. We cannot much wonder that in the old days, before passive immunity, that the sick so frequently succumbed to this dread disease. The death rate formerly was 30 to 50%, and is now practically zero if antitoxin is given early enough. Early recognition and a sufficient dose of antitoxin gives these results. With tetanus antitoxin we have prevention and curative results depending upon site of original wound, time of development of symptoms, and vigor of the application of the treatment.

For the destruction of the bacteria themselves, as was previously mentioned, we have a lysin causing their immediate destruction, and substances aiding the white cells of the blood to absorb and digest them. Agglutinins cause the bacteria to lose their motility and gather in clumps. This facilitates their ingestion by the white cells. Opsonin is another antibody aiding the white cells in the contest with bacteria. This substance appears to disable the germs making them more easily taken in by the leucocytes. They have been likened to a sauce, making the bacteria more palatable for the white cells.

The fate of the bacterium after its contact with the lysin is death and dissolution. Its fate after its ingestion by the white cells is not so certain. The cell may be the executioner, or may only play the role, as some think, of a policeman who carries it to the lymph nodes or spleen, where destruction awaits it.

Precipitin is a substance very closely allied to agglutinins. Its action is on colloid particles or proteins in solution. They are much slower in their response to an infection and are more difficult to demonstrate. This difficulty arises in securing a clear solution necessary to show the clouding of the precipitation.

Precipitins can be elicited against such unformed proteins as milk, serum, white of egg, etc. Animals may be sensitized to these substances and used to identify them. These reactions are so specific and delicate that a determination can be made between the whites of a hen's egg and a duck's egg; between human milk and cow's milk. This test is used as a legal aid. A blood stain can be shown as that of human or animal origin. Dried blood from boards or clothing can be tested with accurate results. In one case a blood stain sixty-six years old gave satisfactory results when tested. Claims have been made of satisfactory test on the blood of two mummies, one 2000 years old and another 5000 years old. These tests are also made to determine the kind of meat in sausage, etc.

There is a group of associated phenomena of such width of range that it includes itching of the nose and running eyes as the mildest of its manifestations to sudden collapse and death in its greatest. To name specifically some of these: 1. Sensitiveness to flower pollen in hay fever and asthma; 2. To epidermal cells of cats and horses producing asthma; 3. Susceptibility to certain articles of diet as urticaria from strawberries, shell fish, etc.; 4. Temporary discomfort from the later injections of a vaccine; 5. Milder "serum sickness"; 6. True anaphylactic shock and death from giving a serum for prophylaxis or cure. The term anaphylaxis (without protection) is applied to these reactions. They are due to a sensitized condition resulting from a previous inoculation of the same protein substance. A definite time must elapse before such sensitiveness is developed. Magendi, a French physiologist, in 1839 first pointed out this reaction. It was not until the use of antitoxic serums became common with their untoward results that the full significance was understood. Flexner, in America, in 1894 and Arthus, a

Frenchman, in 1903, made the experiment that cleared up the subject. There are two doses of foreign protein concerned in the reaction; first is the "sensitizing dose," which may be comparatively small, and second, the "shock dose," the one producing the reaction. This last may be small or large, with results conforming to size of the dose, varying from a slight local reddening to a generalized reaction with collapse and death. The foods most frequently the cause of trouble are eggs and milk, while strawberries and shell fish are not rarely the cause. Among the most frequent results are found in the seasonal attacks of hay fever and asthma, while the most striking are from serum treatment. An occasional fatality (one in 50,000) results from the refined anti-diphtheritic serum, while serious symptoms appear in one in 10,000. The percentage is much higher in tetanus antitoxin, as the product so far is not so refined as in the diphtheria serum.

The question arises as to what uses can be made of these biological facts. Diagnosis in many diseases, and prevention and cure in the large group of communicable diseases due to micro-organisms. In the non-transferable disease we have three types:

(a) Nutritional (scurvy, rickets); (b) Functional (kidney, thyroid, pancreatic disturbances); (c) Due to chemical poisons (lead, arsenic, phosphorus).

It is now known that many of the functional and nutritional diseases are end results of long absorption of bacterial toxic material. Prominent among such sources are tonsils, teeth, gall bladder, bowel stasis, etc.

In diagnosis the bacterium itself by its manner of growth, shape, motility, or staining properties, is the determining factor in diphtheria, tuberculosis, gonorrhea, malaria, sleeping sickness, syphilis and many others. The agglutinins are used in diagnosing typhoid, and so powerful are the agglutinins in this disease that in certain immune individuals the reaction occurs in a dilution as high as 10,000. Recently an experiment was made with blood from a horse immunized against typhoid which showed a potency so high that one drop of serum diluted in a litre of salt solution agglutinated all the billions of typhoid bacilli grown on four slant culture tubes. The agglutination test is useful in identifying the type of pneumococcus. Also it is used in cholera, the paratyphoids, dysentery, etc. No use as yet has been made of this reaction in therapeutic measures. It is the principal means of matching blood in transfusions.

The white blood count is frequently an aid in diagnosis. It does not have so much significance in prognosis as it indicates that the patient is putting up a strong fight, but does not indicate the outcome of the fight. The phagocytic role of the white cell is very important and working with the opsonins is one of the best defenses against bacteria.

The bactericidal power of the blood is due to lysin that may be in varying quantities in normal blood. In an immune blood this power is greatly increased. One cc of the serum of an immune rabbit caused the complete disappearance of 50,000 anthrax bacilli in four minutes. The action of lysins is specific, and while a blood may have a lysin against one species of bacteria, another kind will have no difficulty in living in it. Lysins are formed not only against bacteria but against other foreign cells. The red cells of various animals have been used. The lysins are produced by injecting in the veins of an animal at intervals the substance it is desired to produce a lysin against. The specificity of the reaction is so great that the test can be used in criminal trials to prove a blood stain to be from human or other animal. If the stain is old, the test is not as reliable as that of the precipitins.

On these and other biological facts is built much of the present day medical practice. These facts will serve as a basis for future discoveries of great significance to the human race. We have not even remotely approached the prophecy of Pasteur when he proclaimed to a diseased mankind: "It is in the power of man to make parasitic maladies disappear from the earth." Without question, more children are now reaching maturity than formerly, and an increasing number are coming to the period of senescence.

A brief catalogue of the outstanding steps in scientific discoveries of use to medicine will be of value.

Medical beliefs and practices of ancient days were usually erroneous. One exception to this is a Sanskrit theory of the 6th century that claimed

a relation between mosquitoes and malaria. Such beliefs as disease being caused by evil spirits, the demonical theory, astronomical forces influencing the welfare of mankind, had their adherents. Hippocrates' four body humors: blood, phlegm, bile and black bile, held attention of the physicians for two thousand years and led to the practice of bleeding at so late a date that George Washington came to an untimely death not by tonsilitis, but from the treatment received. The ancients had many sanitary observances conducive to health of the people, viz., the aqueducts of Italy and France, purification by fire (Bible), Jewish regulations concerning lepers, Chinese inoculation of smallpox, etc. We must come down the ages to 1536 to get satisfying facts. This year Para began using mild lotions in treatment of wounds.

Frascator (1546) gave the earliest conception of the contagiousness of disease that led to a practical measure — quarantine. He claimed disease due to "living material" and transmitted by immediate contact, and intermediate agents—fomites.

Janssen made the first microscope in 1590.

In 1659 Leeuwenhoek, a lens grinding janitor, was the first to picture bacteria, terming them "little beasties."

Spontaneous generation lived a long life. Aristotle, three centuries before Christ, declared it, and not until 1769 did Spallanzani prove that air was necessary for this life to begin.

It remained for another, Louis Pasteur, to demonstrate positively that life always came from previous life. Pasteur, of artistic temperament, educated as a chemist, was destined to enter upon investigations, the results of which have seldom if ever been equaled in their importance to the human race. Notably among his many discoveries are: yeasts are alive and change sugar to alcohol; that acid results from growths of rod like, motile microbes; confirmation of the theory of the bacterial cause of rancid butter and the spoiling of other foods. Pasteurization resulted from his experiments, helping the wine growers free their wine from contamination. Diseases among the silk worms took six years of his efforts. His prophylaxis for rabies was probably his crowning effort, because it dealt with a dreadful disease and established definitely that infectious diseases were due to bacteria.

In 1796 Jenner vaccinated against smallpox with cow pox, and was censured by the medical profession as brutal and inhuman.

Following the trail blazed by Pasteur were two men in nearby countries making practical applications of his methods and discoveries, Lister in Edinburgh in his surgical clinic treating his wounds antiseptically, and Koch in Germany discovering the bacteria causing anthrax, cholera and tuberculosis.

This brings us to the latter half of the nineteenth century when every year added some important fact.

Steam sterilization was a single item of great advance.

Klebs, Loeffler, Roux and Behring gave the solution in diphtheria.

In 1882 Metchnikoff revealed the role of the phagocytes.

In 1900 Walter Reed and his commission found the cause of the transmission of yellow fever.

In 1895 Ross found the plasmodium of malaria.

In 1898 Bordet, a Belgian, discovered that lysins are formed in the blood against foreign material, bacteria, corpuscles, etc.

In 1903 Wright discovered opsonins.

In 1904 Smith definitely established the idea of anaphylaxis.

In 1908 Flexner gave the cause of epidemic cerebromeningitis.

In 1913 Behring discovered the "toxin-antitoxin" combination as diphtheria vaccine.

Knowing the causal agents, their manner of growth and means of transmission, give in diseases our opportunity to prevent their spread. So prevention has become the watchword. Early recognition is often a necessity for both a cure and the curtailment of an epidemic. As a result, all over the globe laboratories are erected and are ever on the watch to keep away these enemies of mankind—the bacteria. How prophetic were the words of Pasteur when he declared them to be "The sacred dwellings, the temples of the future, of riches and comfort."

OVARIAN INSUFFICIENCY AND OVARIAN THERAPY*

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Introduction—A wise man once remarked that in medicine empiricism had always led the way. Quinine was just as effective in malaria before the plasmodium was discovered as it has been since that time. This empiricism is also true of ovarian therapy.

The first attempts along the lines of ovarian therapy probably were made at the Landau Clinic, in Berlin, in 1896. Mainzer[1] reports the case of a girl of 23 in whom double salpingo-ooperectomy had been performed for extensive pelvic inflammatory disease. She developed severe vasmotor symptoms, which failed to respond to ordinary methods of treatment. Ovarian therapy was then resorted to, probably by mouth. Before the beginning of the treatment, the patient averaged about twelve severe attacks per day of flushing of the head, giddiness, sweats, etc. Within three days of the beginning of the treatment the attacks had diminished to a daily average of five. To make sure that the effect was not merely psychic, the patient received a substitute (scraped meat) on the seventh and eighth days, and felt much worse. On again being given the ovarian substance, improvement was again noted, to be followed by retrogression when the substitute was given again on the fourteenth day.

The Clinician urged to wait—In spite of these things, the clinician is being urged constantly to wait until the experimental physiologist and the bio-chemist have completed their investigations and given their blessings to endocrine therapy before he uses it in private practice. Yet nearly every advance made by these workers has strengthened the position of the clinician. Discoveries by the physiologists have in no way changed our conception of the clinical picture of ovarian insufficiency nor the indications for therapy. The clinician cannot refuse to use ovarian preparations in the treatment of his patients merely because the physiologists announce that their knowledge of ovarian function is incomplete and ovarian preparations available now less desirable than they are apt to be a few years hence. We are all willing to admit with the laboratory workers that they have failed, up to date, to isolate the hormones of the ovary in the proper concentration and to furnish them in the best possible manner for clinical use; but we are not ready to throw our clinical observations overboard because of the physiologist's difficulties. A few years ago it was said that ovarian preparations could have no effect when given by mouth, and some writers intimated that no commercial preparations could have any beneficial action because the hormone was lost when the manufacturer subjected the ovary to a degreasing process. Yet Novak[2] says, "an increasing number of observations indicate that even by mouth the principle exerts an estrus producing effect on spayed animals." Laquer and DeJong[3] report the preparation of a water soluble hormone from the ovary. And the J. A. M. A.[4] says, "This raises . . . the question . . . whether the vaginal reactions . . . are really reliably criteria of ovarian hormone action." Novak[5] says "Contributions are being made so rapidly that no present point of view should be urged too dogmatically or too inflexibly." This is certainly the most conservative and sensible attitude that could be advised at this time. Novak[6] also says, "Furthermore it is not fair to criticize the clinicians too harshly on this point. Is any other method of treatment of these symptoms based on grounds which are any more rational or does any other give better results? If so I do not know of it." This is probably the spirit that actuates most of us. We are eager for the physiologist to give us something more definite and satisfactory, but in the meantime these patients demand relief and this form of therapy seems to give relief better than any other.

Some years ago when Allen and Doisy isolated the female sex hormone from the liquor folliculi we were somehow given the impression that it could be found in no other part of the ovary and that from the very nature of the thing it could have no effect by mouth and that commercial preparations with which we had been supplied up to that time could have had no beneficial effect on the patient. Yet it was not long until Frank and his co-workers isolated the same hormone from the corpus luteum and the placenta. They gave the name "gestational gland" to the three structures; i. e., the liquor folliculi, corpus luteum, and placenta. Later the same

*Read before Rock Island County Medical Society, Oct. 16, 1928.

hormone was isolated from the blood stream a few days before the menstrual period, and from the menstrual blood during the first day or two of the flow. It has since been isolated from the blood of the pregnant woman and from her urine. One firm is now making a commercial preparation of the female sex hormone from the amniotic fluid of cattle.

Should Ovarian Therapy be used exclusively in a teaching clinic?—Novak[7] suggests that if these preparations are used clinically it should be done in the large teaching clinic. But there are many objections to this. The material in such clinics is—or should be—of lower grade mentally than that met in private practice. This makes cooperation less satisfactory and the follow-up work more difficult. Contact with such patients is not apt to be maintained over so long a period of time as is the case in private practice. Finally, the private practitioner by intermittent medication such as was mentioned in the Landau clinic exercises a control over his cases and results which is probably as accurate and scientific as will ever be possible in the case of the human animal.

Even Novak[8], though very pessimistic, says, "I do not, of course, mean to indicate that all efforts at therapy in the human subject should be withheld until our knowledge is more complete. This, indeed, would be a mistake, for, after all, the problem of the human sex cycle can in some of its aspects be studied best, and perhaps only, in the human subject, for the animal cycle differs from the human cycle in many respects. No harm is done the patient by the use of any of the extracts that have been employed."

Etiology of ovarian insufficiency—

1. Infections either acute as flu, typhoid, etc., or chronic such as tuberculosis, or other wasting diseases, pernicious anemia, etc.

2. Local infections in the pelvis, such an gonorrhea or puerperal sepsis.

3. Endocrinopathies, hyperthyroidism, hypopituitarism, tumors of the adrenal cortex, vitamine deficiency.

4. Congenital, these cases may all be due to some endocrinopathy.

Occurrence—

Quoting Novak[9] again, "Among the clinical manifestations which may reasonably be ascribed to hypofunction of the ovary are the following:

1. Amenorrhea (absence of menstruation), hypomenorrhea (scanty menstruation), and oligomenorrhea (abnormally infrequent menstruation), delayed puberty, and premature menopause.

2. The vasomotor symptoms of the menopause (either natural or artificial).

3. Some cases of sterility (probably only a small proportion).

4. Possibly some cases of so-called primary dysmenorrhea, genital hypoplasia, obesity, repeated abortion, and menstrual headaches."

Engelbach[10] says, "I cannot agree that these women are comparatively free from symptoms, are happy and have no serious effects from the cessation of the menses. Analyses in a large number of cases showed that they have very serious reactions. Anyone who sees a great number of these patients with ovarian insufficiency, either primary or secondary, must realize that they do have very serious constitutional disability. The disability is often extreme; for instance, persistent vomiting, over a long series of years, with very marked nervous and cardio-vascular symptomatology so severe as to incapacitate these patients absolutely. It has been my experience in treating a large number of castrates, aged from 15 to 16 years and up to late adult life, that positive relief from these symptoms was obtained by giving large doses of ovarian substance hypodermically."

Drips and Ford[11] say, "systemic complaints which we regard as due to the basic ovarian disturbance are common. Patients with a tendency to amenorrhea experience menstrual molimen manifested by backache, bearing down or cramping pains in the pelvis, nausea or vomiting, headache and a chilly sensation. Persistent vomiting or anorexia nervosa is a most distressing neurotic manifestation which is present in some cases." Drips and Ford included under ovarian insufficiency, cases of metrorrhagia showing extreme irregularity in the occurrence of the flow. Profuse and prolonged periods being interspersed by considerable periods of amenorrhea. For these the hypophysis was irradiated with beneficial results in most cases. It is doubtful if such cases are due to ovarian insufficiency. Engelbach and Tierney[12] referred to such cases as being due to hypopituitarism of the anterior lobe. The results of Drip and Ford together with

the recent work of Evans and Simpson[13] make it seem extremely likely that such menstrual irregularities are due to some disturbance of the pituitary function rather than to a primary hypogonadism.

My experience coincides with that of Engelbach. Nor would I agree with Novak that cases of amenorrhea occurring in the course of tuberculosis should be disregarded. While the ovarian insufficiency is undoubtedly secondary and due to the tuberculous infection, yet in my experience the proper use of substitution therapy in the form of ovarian preparations by mouth or hypodermic, preferably the latter, has a very favorable influence on the patient's health. One case under my care gained 10 lbs. the first few weeks after she began taking ovarian substance by mouth, and 25 lbs. the first year.

It is likely that the gynecologist does not see patients suffering from the same symptoms as does the internist or endocrinologist. The latter are apt to be confronted with gastro-intestinal symptoms of nausea and vomiting, or with nervous symptoms such as occur at the menopause, or earlier in life, if the insufficiency is of severe degree. While the gynecologist probably sees more cases offering as the presenting symptom some irregularity of the menstrual flow varying from a more or less complete amenorrhea or menorrhagia. In these conditions ovarian therapy in my hands has been less successful than in the ones mentioned above as being the types most frequently seen by the internist or endocrinologist. It is possible that Engelbach is correct in his theory that the ovary has other hormones performing other functions than the female sex hormone. Certain it is that ovarian therapy is more successful in the field of subjective complaints than in regulating disturbances of the menstrual flow. The old argument that this is due to psychology is ever advanced against the correctness of this view, but even Novak[14] says it is hard to escape the conclusion that ovarian preparations were of some value.

Amenorrhea is probably not due to primary ovarian insufficiency nearly so frequently as is believed by the profession at large. Perhaps it is due to hypopituitarism more often than to hypogonadism. It is also due to thyroid disorders and sometimes to tumors of the adrenal cortex. Cases of menorrhagia or metrorrhagia so infrequently yield to ovarian therapy that I am doubtful if such cases are due to ovarian insufficiency. Cases of menorrhagia may be due to persistent follicle cyst with lack of formation of a corpus luteum—a failure of ovulation. Papanicolau in 1927 reported that by injecting a corpus luteum preparation into guinea pigs he could bring about a definite retardation of ovulation and could delay or inhibit estrus in this animal. In other words the hormone in the corpus luteum seems to be somewhat antagonistic to that obtained from the follicle fluid. A number of observers have reported that by injecting corpus luteum preparations a number of days before the expected menorrhagic period, the flow could be materially reduced and the period shortened.

Wrong policy encouraged in Endocrine Disorders—In the field of endocrine disorders we do not follow the practice advised in other fields of medicine, that of attempting to recognize diseased conditions early or before they become severe. We reverse that practice in dealing with the endocrinopathies and insist that they be far advanced or severe before a diagnosis is made. When we consider how readily the ovary is affected by infection, vitamine deficiency, etc., it is not difficult to believe that cases of ovarian insufficiency are of much commoner occurrence than is usually taught. Delayed puberty is many times due to this. Dysmenorrhea frequently arises from the same cause. The earlier treatment is begun in such cases, the greater the likelihood of prompt and permanent cure. Graves[15] says cases of dysmenorrhea yield much more readily in young women than in older ones. He gives the ages 18 to 25 as being the most favorable. My experience agrees with this, although dysmenorrhea in older women frequently yields to this treatment. Hypodermic administration, of course, being much more efficacious than the oral route.

Symptoms—For my own guidance I have enumerated the following symptoms as those occurring most frequently in ovarian insufficiency:

1. Dysmenorrhea, especially that type where the pain occurs before the flow begins and persists throughout the period.

2. Abdominal pain occurring near the periods, located many times in the right lower quadrant but being more of a burning character than that usually associated with acute appendicitis.

Though it needs to be considered in making a diagnosis of chronic appendicitis.

3. Nausea and vomiting—this resembles that occurring in the early months of pregnancy. Indeed, the nausea and vomiting of early pregnancy may be due to some sort of ovarian insufficiency, at any rate, it sometimes yields to treatment by injections of corpus luteum preparations when nothing else avails.

4. Menstrual headaches are perhaps due to ovarian insufficiency, but perhaps are as often due to a concomitant hypopituitarism.

5. Irregularity in the character in the flow and in the pain that accompanies it. Normal periods free from pain alternate with scanty painful ones.

6. Irregularity in the menstrual periods—i. e., where the intervals are too long.

7. Numbness of the extremities. This occurs especially at night and most frequently in women passing through the menopause. Hot flashes and other phenomena of the menopause.

8. Mental depression. This is common and almost characteristic. That it is due to ovarian insufficiency is shown by the therapeutic test. The injection of ovarian preparations hypodermically many times produces such prompt and striking relief as to be quite astonishing. The injection of other substances is not followed by any such relief.

9. Mental and physical sluggishness occurring at the periods.

10. Lack of strength and endurance—not due to other causes.

11. Amenorrhea, relative or absolute, sometimes due to this cause. Other factors, endocrine and otherwise, should be looked for. Other endocrine glands are almost as frequently at fault as the ovary.

12. Colds or sore throats occurring at the menstrual periods. This is a very common complaint, and a little inquiry into cases of frequently recurring colds will show a large number exhibiting this coincidence.

13. Acne occurs frequently, only at periods.

Diagnosis—This depends on a careful history which should elicit an etiological factor and a considerable percentage of the symptoms just enumerated. A careful and very thorough physical examination which should rule out other conditions. Such laboratory work as will be of assistance in excluding other conditions. We have no laboratory tests at this time which are of any direct positive value in determining the state of the ovarian function. It is quite likely that Frank will develop his test for the female sex hormone to the point where it can be used in practice as well as in research work?

Differential diagnosis — Tuberculosis, pernicious anemia, and other wasting diseases should be discovered if present. While they may cause ovarian insufficiency, this should be recognized as secondary in such cases. Neurasthenia and manic depressive states—ovarian insufficiency many times causes these conditions, and it sometimes is difficult or impossible to tell how much the ovarian condition is responsible for the symptoms except by therapeutic test. A good many case reports occur in the literature showing the beneficial effects of ovarian therapy on these conditions where there is an accompanying or causative ovarian insufficiency. In cases of amenorrhea one should first exclude tuberculosis and other wasting diseases. After the search has narrowed to the endocrinopathies, one should look for signs of tumor of the adrenal cortex—roughening of the skin, increased hair suit over the body with falling of the hair on the head or even baldness. Increase in muscular strength, coarseness of the voice, and a general decrease in the feminine characteristics. Hypopituitarism of the anterior lobe: If this is of the pre-adolescent type, the lack of development of the osseous and muscular system is characteristic; if of the post-adolescent type, there is a loss of muscle tone, libido, increase in the quantity and frequency of the menstrual periods. Sometimes extreme irregularity of the periods—menorrhagia alternating with considerable periods of amenorrhea. Hyperthyroidism of course needs no mention.

Treatment—This consists of the usual attention to hygiene and diet and the general health with specific treatment by the administration of ovarian preparations. The preparation used and the method of administration will depend somewhat on the preference of the men using it, though the hypodermic administration is much more certain in its results than is that by mouth.

Preparations—Three preparations are available: Ovarian substance being the whole ovary, desiccated for use by mouth in the dose of five grains or more t. i. d. or a watery or oily ex-

tract of the same for use by hypodermic. Corpora lutea preparations consist of the dried corpora lutea for use by mouth in the same dosage as that of the whole ovary, or liquid extracts for hypodermic use. And finally, ovarian residue being that portion of the ovary remaining after the corpora lutea are removed. This is desiccated for use by mouth or extracted by water or other liquids for hypodermic use. It is quite likely that the manufacturer is unable to remove all the corpora lutea, and that as a consequence ovarian residue is really ovarian substance. These three preparations are sold under a variety of names, especially those for hypodermic use.

Administration—There is no question but that better results are obtained when these preparations are given subcutaneously or intramuscularly or even intravenously—though the latter route needs to be used infrequently. The dosage usually given is one c.c., representing the amount obtained from one or two grams of the dried preparation. The interval at which it is given depends on the individual case. Some women experience relief of their nervous or gastro-intestinal symptoms, lasting for 24 or 48 hours after an injection; others an even longer period. In the nausea and vomiting of pregnancy, it may be necessary to repeat the dose two or three times per day. Some cases presenting nervous or gastro-intestinal symptoms report great relief if the injections are given at intervals of a week. There is some objection to hypodermic medication, but any medication represents the lesser of two evils, even when it is a life saving proposition.

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COMPOUND COMMINUTED FRACTURE —A CASE REPORT

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The following case is reported because it presents several points of unusual interest.

On November 5, 1926, Albert L., age 7 years, was one of several boys of his age who were playing about a large telephone cable reel which stood on the tree bank near Albert's parental home. The reel tumbled off the tree bank, crushing the right leg of the boy in the mire of the gutter—street was not paved.

Shortly after the accident the writer found the little patient lying on a bed to which he had been carried by neighbors. Condition of the patient was bad and there was evidently much loss of blood. A tourniquet above the fracture, which

FIG. 1. FRACTURED LEG BEFORE REDUCTION.—DIAGRAMMATIC.

Fig. 1. Fractured Leg Before Reduction.—Diagrammatic

looked like a Boy Scout job, I believe, prevented a fatal hemorrhage.

Fig. 1. A drawing from memory soon after the accident shows better than words can describe the nature of the injury. The soft parts were severed and stripped off the bones for a considerable distance except a narrow strip on the fibular side, where soft parts including skin remained intact, and a deep flat strand posteriorly including the posterior tibial and popliteal arteries. In this flap pulsation could be felt.

The patient was taken to St. Joseph Hospital, put to sleep, bleeding points ligated, wound

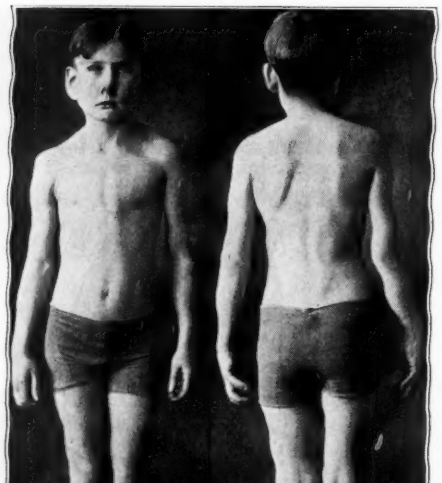
cleansed of dirt and particles of clothing, the bone fragments placed in the best possible position, torn muscles sutured end to end, skin wound partly closed.

The injured limb was placed in a fracture box and Carrel-Dakin treatment instituted.

Amputation was seriously considered. Should the foot not live I would amputate as soon as that unfavorable result was inevitable.

About the fourth day very light Buck's extension was applied.

On December 17 the fractured limb was



Figs. 2 and 3. (Right)—Injured Leg Is Straight Anatomically, and No Undue Rotation of Foot, No Compensatory Lengthening. Note 2 views—same lad.

placed in a plaster cast with two large windows through which the wounds could be dressed.

Recovery was slow and eventful. On January 22, 1927, the x-ray showed bony union and the tibial and fibular fragments at sight of fracture were in one callus, also a small sequestrum in the free fibial fragment. The dead bone was removed. Two sinuses developed and were persistent.

Another x-ray taken on August 31 revealed a small piece of dead bone not previously shown, in the upper tibial fragment. It was removed.

About a year later, that is on July 11, 1928, it became necessary to remove a small sequestrum in the distal fibular fragment.

During the following two months the sinus remaining was once thoroughly curetted. Examination of patient October 27, 1928, I found the sinus healed solidly and remained so to this date, July 20, 1929. Patient discharged and in good condition.

SUMMARY

An extremely bad compound comminuted fracture. Part tibial bone missing.

Major part of soft parts severed.

The usual conditions present indicating amputation.

Conservation of entire limb was successful.

No shortening, determined by careful measurements.

Patient walks without limping.

Photographs of patient were taken at time of dismissal of case.

508 Professional building.

THE USE OF FORCEPS

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The progress and termination of labor in an overwhelming percentage of all women is a physiological act which should require no interference. However, every confinement should be conducted with the thought that it is a potential emergency major surgical operation. There is always a small percentage of patients in whom nature's unaided efforts are futile and result in the death of the mother, the child or both. Obstetrics as a specialty arose because of the dire needs of this small group.

The pioneers of previous generations concerned themselves chiefly with the problems of pathological labor, quite content to let the normal progress of labor alone. Beginning with the aseptic era, the obstetrician became more and more an obstetric surgeon and the practice of obstetrics acquired more and more a surgical trend. This trend quite naturally has permeated the entire medical profession since the leaders of the past fifty years have been the teachers and exemplars of the profession at large in whose care the bulk of obstetrics has and will reside for

many years to come. The result of this surgical tendency has been a misdirected increase in the frequency of operative interference. It is entirely fitting that the general practitioner should hear and read the views of his colleagues who have specialized so that both groups may benefit by an exchange of experiences.

This paper will be limited to an exposition of certain principles in the uses of forceps which

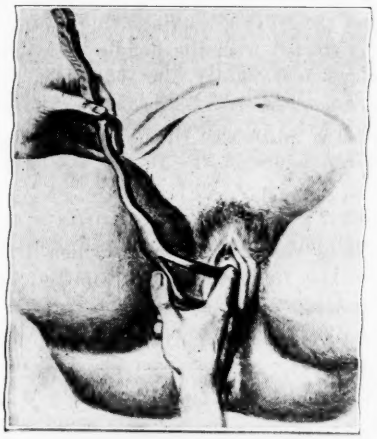

Fig. 1. Introducing the left blade to the left side of the pelvis. (Doderlein).

have justified themselves in my experience. What is the essential purpose of forceps? Obviously, it replaces the propulsive push of the maternal powers, both voluntary and involuntary, by a pulling effect. Whatever the cause, the fetal head is no longer advanced from within but must now be advanced from without. In the absence of direct indications for haste, I believe this traction effect is best accomplished by an exact imitation of the natural progress of labor without the addition of any harmful factors.

The intelligent use of forceps presupposes something more than deftness in their handling. The attending physician must know something of the capacities and limitations of the mother's pelvis. Pelvic measurements may be omitted in a multipara with a satisfactory previous confinement history but are imperative in the unknown quantity, the primipara. Previous knowledge of a contracted inlet or outlet may mean saving the life of the baby and avoiding the mutilation of the mother.

Certain prerequisite conditions must be fulfilled before forceps may be applied. These are:

1. The cervix must be fully dilated.
2. The membranes must be ruptured.
3. The pelvis must not be too contracted.
4. The fetus must present correctly.
5. The head of the fetus must be neither too large nor too small.
6. The head must be engaged.
7. The fetus should be living.

Then there must be a proper indication. An excellent rule in the conduct of a confinement is "non-interference without a suitable indication." Forceps indications generally recognized are:

Maternal

1. No progress after one hour of vigorous second stage labor with the head on the perineum.
2. Secondary inertia—due to such causes as maternal exhaustion, disproportion because of too large a fetus or too small a pelvis; resistance of the pelvic floor.
3. Miscellaneous maternal pathology-cardiac, pulmonary, toxemic, uterine, i. e., premature separation of the placenta, threatened rupture, placenta previa, etc.

Fig. 2. In the final upward traction on the appearance of the parietes the blades may be removed and the head expressed by a compression grip at the level of the anus—(Modified Ritgen method).
The capillary pulse in the visible scalp serves the author as an index of the condition of the fetal heart.

Fetal

Early signs of asphyxia.

An accurate diagnosis of the position of the head is fundamental. More fetal deaths and

maternal morbidities are due to forceps incorrectly applied because of ignorance of the true position of the head, than to any other single factor. Occiput posterior, deep transverse arrest, deflexion and extension attitudes all are amenable to safe delivery when diagnosed but end in disaster when attacked in ignorance of the true diagnosis.

Those of us who practise gynecology and take

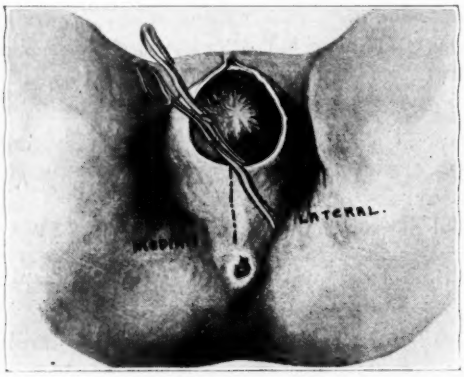

Fig. 3. Dotted lines indicate the direction for the incision of the perineum for laterial and median episiotomy.

pride in the successful repair of third degree tears are indebted for most of these to someone's failure to recognize a persistent occiput posterior which is pulled through rather than over a perineal body. The lacerated cervix with eversion and erosions, chronic endocervicitis, sterility and abortions, and the painful broad ligament scars are too frequently the evil trail left by those who pull the head through a partially dilated cervix.

The choice of the instrument is the next consideration. The usual types of forceps are carefully constructed with appropriate cephalic and pelvic curves made to fit the bulging parietes of the fetal head and to follow the curve of the pelvic axis. Each instrument has its place.

The Naegele forceps with its short narrow shank is ideal for an outlet application. The Simpson is the best instrument for general use in low and mid positions. The Breus and Tarnier compete for the high application, the former providing a degree of flexibility in the grip of the blades because of the joint between blade and shank, the latter a rigid but more injurious hold on the fetal head. The Kielland, originally devised for the high head permits of cephalic application in any position or level of the head and has achieved great popularity in the continental clinics. There is no pelvic curve and the lock is replaced by a sliding bar arrangement. The Tucker-McLane has solid blades which permit of easy adjustment to the appropriate position on the head but requires exact cephalic application to avoid slipping.

Technic: The correct application of the doubly curved blades involves avoidance of injury to the narrow introitus and to the walls of the vagina.

This is accomplished in three ways; the left blade is started with the handle over the right groin held very lightly, the vagina is protected by two fingers inserted posteriorly on the left and the blade is introduced chiefly by its own weight and the pressure of the thumb of the vaginal hand. (Fig. 1.)

Its final position over the parietes is adjusted laterally by the internal fingers which lift it into place. The right blade is introduced and adjusted in like manner.

When correctly applied the blades will lock

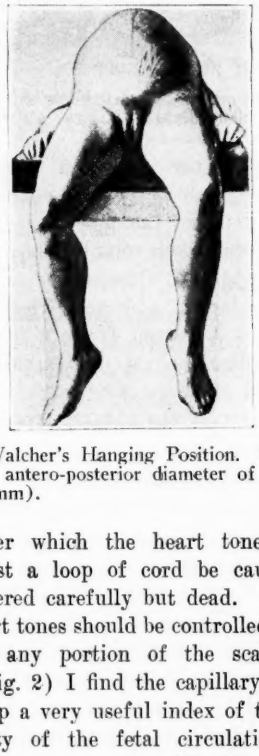

Fig. 4. Walcher's Hanging Position. This position enlarges the antero-posterior diameter of the superior strait. (Bumm).

easily, after which the heart tones must be checked lest a loop of cord be caught and a fetus delivered carefully but dead.

The heart tones should be controlled constantly but when any portion of the scalp becomes visible, (Fig. 2) I find the capillary circulation in the scalp a very useful index of the presence and quality of the fetal circulation. Intermittent finger pressure with the consequent blanching and more or less rapid return of color affords a very reliable criterion of the condition

of the fetal heart. This sign as far as I am aware has not been described.

Trial traction having certified to the firmness of the grip of the blades, extraction is now undertaken.

From this step onward nature is the guide. Each pull is an attempt to imitate the effect of a contraction both in intensity and duration. The direcion of the pull, that is, posterior, horizontal or lifting toward the vertical, is determined by the direction of the axis of that portion of the pelvis in which the head is resting.

The shanks are grasped, rather than the handles, to avoid any chance of compression of the fetal head and the rest periods are twice as long as the periods of traction.

Thus the head is brought into the vulvar outlet in imitation of the working of the maternal powers.

The anal sphincter gapes and the perineum is bulging.

At this time and not before, episiotomy is considered, a median incision for long perineums and medio lateral for short perineums. (Fig. 3.)

The final delivery of the head may be completed with the forcep or perferably in my opinion by removal of the forcep and extrusion of the head by a compression grip of the perineum opposite or posterior to the anus, the pressure thus being applied beneath the fetal malar eminences and remote from the eye sockets. (Fig. 2.)

Ordinarily, gentle horizontal traction on the bony prominences of the head, chin and occiput, or mastoids and jaw angles, suffices to produce shoulder rotation and delivery of the anterior shoulder, after which a more vertical pull lifts the posterior shoulder over the perineum when the body can be extracted by a shoulder grip.

If a hand is visible that arm should be delivered before bringing the shoulders through the vulvar outlet.

When the pull on the neck seems at all severe, it should be avoided and the shoulders rotated and extruded by pressure on the fundus of the uterus. Haste is rarely indicated. Deliberateness permits control of asepsis and the safeguarding of fetus and mother from unnecessary injury.

Certain special situations warrant a word. If the head is at the inlet and forceps must be applied, remember to enlarge the antero-posterior diameter of the inlet by dropping the thighs in hyperextension; "Walchers position." (Fig. 4.)

Scanzoni forceps rotation of an occiput posterior should be considered only if the head is loose in the vagina—a tight fit is much better handled by manual rotation but neither should be attempted until the head is in the true pelvis.

Forceps on the after-coming head in breech extractions should not be necessary and fetal injury usually can be avoided by exerting 90% of the propelling force from above, just over the symphysis.

The chief purpose of this paper has been to emphasize that when forceps extraction is indicated and a correct diagnosis has been made, the closest imitation of nature's technic is the best technic to follow. By so doing, both mother and fetus will receive the maximum benefit and sustain the minimum injury.

DEATH OF A DAUGHTER OF CHARLES DICKENS

Mrs. Kate Perugini, daughter of Charles Dickens, died recently in London. She was born in 1839 and was the third child and second daughter in a family of ten. One son, Henry Fielding Dickens, born in 1849, still holds the office of sergeant at law for the city of London.

The children of Charles Dickens' body are disappearing but his brain children know no death. Florence Dombey, Little Nell, Little Dorrit and Jenny Wren, the doll's dressmaker, live today immortal. Paul Dombey is still listening to what the waves say, Oliver Twist lives yet in the dark purlieus of London's slums, and Joe the waif is being made to "move on" unendingly by the police. And his girls can be seen everywhere: frivolous Dolly Varden, demure Ruth Pinch, faithful Agnes, laughing Kate Nickleby, willful Bella Wilfer and coquettish Arabella Winkle are here living and loved forever.

Dickens himself seems remote, a dweller in a different age. It is with a start that one receives this reminder that the great novelist is only a generation's remove from the present.

PHONEY-GRAPHS

"Dear Mestor Hines: I got your letter about what I owe you. Now be pachent. I ain't forgot you. Pleez wait. When some fools pay me I pay you. If this was judgment day and you was no more prepared to meet your Master as I am to meet your account, you sure would have to go to hell.

"Trusting you will do this, I am yours truly."—A delinquent subscriber's letter to the *Benkelman Post.*—*West. Hos. & Nurses Review.*

Society Proceedings

ADAMS COUNTY

The annual all-day fall meeting of the Adams County Medical Society was conducted by members of the faculties of the University of Pennsylvania School of Medicine and the Graduate School of Medicine of the University of Pennsylvania, October 14, 1929.

There was a breakfast for our distinguished visitors given at the Hotel Quincy, at which 25 were present. The scientific meeting was called to order at the Elks' Club about 9:25 a. m. by the president, Dr. J. W. E. Bitter. At the morning meeting there were addresses as follows: Dr. William Bates, "Differential Diagnosis—Abdominal Parietal and Visceral Disease"; Dr. R. H. Ivy, "Fractures of the Jaw"; Dr. T. Turner Thomas, "Fractures and Dislocations."

At noon the Adams County Medical Society and their guests, joined with the Quincy Rotary, Kiwanis, Lions and Exchange Clubs for luncheon at the Elks. There were nearly 300 present. The meeting was turned over to the secretary who after a few brief remarks introduced Drs. L. H. Nickerson, A. H. Bitter and M. E. Bitter, all graduates of the University of Pennsylvania. The secretary then turned the meeting over to the president of the Society, Dr. J. W. E. Bitter, who introduced the two speakers. Dr. Ravdin gave a talk on "Medical Biology" with a special plea for vivisection. Dr. Eliason gave a talk on the "Significance of Pain in the Abdomen."

At 2:15 the scientific meeting was resumed and there were papers by the following: Dr. I. S. Ravdin, "Surgical Aspects of Gall-Bladder Physiology"; Dr. E. B. Piper, "Breach Presentations"; Dr. E. L. Eliason, "Duodenal Ulcer." The program was concluded about 4:45 p. m.

At 6:45 there were 150 persons assembled for the banquet given in the Quincy Country Club. Dr. C. D. Center presided as toastmaster. He called on all of the University of Pennsylvania guests for remarks. This was followed by a lantern slide and motion picture demonstration on "Bronchoscopy," by Dr. Gabriel Tucker. Then a paper and motion picture demonstration of "Massive Atelectasis," was given by Dr. W. Estell Lee. Following this, the toastmaster called on the secretary of the Illinois State Medical Society, Dr. Harold Camp, for a few remarks. The meeting adjourned about 10:15 p. m.

The total attendance for the day was at least 225.

HAROLD SWANBERG, *Secretary.*

BOND COUNTY

Physicians and surgeons from Fayette, Clinton, Madison and Montgomery counties were guests of the Bond County Medical Society at a dinner at the Thomas Hotel, October 11, at which time those present listened to two splendid addresses by Dr. C. H. Shutt and Dr. Sinclair Luton of St. Louis, as well as short talks from doctors representing the four counties mentioned.

Following a splendid dinner the medics enjoyed a 30-minute social hour at which Dr. Cleveland H. Shutt, president of the St. Louis Medical Society, addressed the doctors on "Gall Bladder Troubles." Round table discussion followed the address of Dr. Shutt. Dr. B. F. Lischer of Mascoutah, who was to give a pen picture of the country doctor, was unable to be present. Dr. Luton, who is an instructor at Washington University Medical School, talked on "Common Disorders of the Heart," and a discussion also followed his address. Both addresses were very interesting and much enjoyed by those present.

Short talks were also made by Dr. A. R. Whitefort of Fayette County, Dr. J. J. Moroney of Clinton County, Dr. Ewald Hermann of Madison County, and Dr. A. S. Needles of Montgomery County.

WM. T. EASLEY, *Secretary.*

IROQUOIS COUNTY

The Iroquois County Medical Society met in regular session at the Nurses Home, Watseka, at eight o'clock Sept. 19. Vice-President Hedges presided.

The secretary read a communication from Dr. S. E. Munson, our district councilor, inviting us to meet with the Ford County Society and arrange a program for a meeting at Paxton, October 10 at which Dr. Fredrickson, our state society president, would be present. Dr. Harry M. Hedge of Chicago was then introduced and gave a very interesting talk, illustrated with lantern slides, on "Common Diseases of the Skin." Many questions were asked and a lively interest was manifested by the members present. A rising vote of thanks was tendered Dr. Hedge for coming down and giving us his time and profitable lecture.

Meeting adjourned at 10:20 after which a delightful lunch was served in the dining room by the hospital superintendent.

C. H. DOWSETT, *Secretary.*

OGLE COUNTY

The Ogle County Medical Society met at 6:30 p. m. on September 26, 1929, at the Rock River Gold Club, Oregon, Illinois. Before dinner there was a brief business meeting with election of officers as follows: President, J. M. Beveridge; vice-president, C. H. Schaller; secretary-treasurer, L. Warmolts; delegate, W. E. Kittler; alternate delegate, A. B. Bogue; censor, F. G. Andreen.

Dr. Beveridge presented a pen and ink drawing, rendered by his son of a crest that could be used to adorn the Society's stationery. It met general approval and it was decided that a plate be made.

The scientific program followed with talks on Hyperthyroidism by Dr. Edwin P. Sloan from Bloomington, and Cesarean Section by Dr. Maurice Rogers from Rockford. Both the papers were of considerable interest and brought an animated discussion.

The meeting adjourned to meet again at Byron, Illinois, some time in November.

L. WARMOLTS, *Secy.-Treas.*

STEPHENSON COUNTY

The fall district meeting of the Stephenson County Medical Society was held at the Freeport Country Club, Oct. 4, with a luncheon at noon and the meeting followed. The following men presented papers:

Donald C. Balfour, Mayo Clinic, "Ulcers of the Stomach and Duodenum."

Chas. F. Read, Loyola University, Chicago, "Diagnosis in Neuro-Psychiatry."

Ellsworth Smith, Washington University, St. Louis, "Relationship of Hypertension to Renal Disease."

A. A. Strause, Chicago, "Ulcers of the Stomach."

TRI-COUNTY MEDICAL SOCIETY

The annual meeting of the Tri-County Medical Society, consisting of Henry, Knox and Warren County Medical Societies, was held at the Elks Club, Kewanee, on Thursday, October 10, 1929.

The meeting began at 4:00 p. m. and the first speaker on the program was Dr. George H. Coleman, Assistant Clinical Professor of Medicine, Rush Medical College, Chicago, who selected as his subject "The Blood Picture in Health and Disease." Dr. Coleman gave a very interesting talk on this subject, reviewing the work of many recent investigators, and then gave the clinical significance of various blood findings in disease conditions. The subject was discussed by Dr. C. P. White of Kewanee, Dr. George Parker and Leslie Rutherford of Peoria.

The next speaker was Dr. Bayard Holmes, Professor of Medicine, Chicago Medical School, Chicago, who talked on "Tumors of the Mediastinum." Dr. Holmes gave a very practical talk on this highly interesting subject, reporting several cases under his care recently, and showed roentgenograms of these cases. Several present discussed this talk, the discussion being opened by Dr. Roswell T. Pettit of Ottawa, who also had several interesting pictures of cases of this nature.

An appetizing fried chicken dinner was enjoyed by all present at 6:00 p. m., and immediately after the dinner, Dr. J. E. Westerlund, who officiated as toastmaster, introduced the mayor of Kewanee, Hon. James W. Andrews, who gave an address of welcome, and the response was given for the Tri-County Society by Dr. Harold M. Camp of Monmouth. Vocal solos were given by Miss Myrtle Nelson accompanied by Dagny Johnson on the piano.

The President-elect of the Illinois State Medical Society, Wm. D. Chapman of Silvis, was present and was introduced, making a short but snappy talk.

A monologue was given by Ross Harvey, Davenport, Iowa, which was greatly enjoyed by all present, although a few "slams" were taken at some of the physicians in a friendly way.

The evening portion of the scientific program consisted in the showing of the Canti Cancer Films, under the supervision of Dr. Gilbert FitzPatrick of Chicago. Dr. FitzPatrick prefaced the showing of the films by a talk on the methods used in the making of these unusual films, and told of the various contents of the next reel, while they were changed. This was one of the most interesting numbers ever shown at a meeting of the Tri-County Society.

Although the weather was unfavorable, the general attendance was about one hundred fifty, among the cities represented being Peoria, Rock Island, Moline, Galesburg, Monmouth, Macomb, Rushville, Augusta, Ipava, Princeton, Ottawa, Wyanet, Good Hope, Bushnell, Aledo, Geneseo, Orion, Galva, Cambridge, Altona, Silvis and Kewanee.

The Tri-County Society will hold its 1930 annual meeting in Galesburg, and a general invitation is extended to all physicians in Western Illinois, Eastern Iowa, and any other points, to come and see a live society.

P. J. McDERMOTT, *Secretary,*
Henry County Medical Society.

Kewanee, Illinois.

Marriages

CLAIR EUGENE CARR, Chicago, to Miss Alta Blanch Davidson of Lawrence, Kan., at Evanston, Ill., September 14.

HOMER J. ELKINS, Mounds, Ill., to Miss Ruth Dwyer Steuver of Indianapolis, September 2.

VIRGIL MARTHA GILCHRIST, Urbana, Ill., to Mr. Portius M. Wheeler of Monticello, September 7.

LEON W. KELSO, Paxton, Ill., to Mrs. Harriet Edwards of Carlinville, September 7.

CALVIN ALBERT LAUER, Danville, Ill., to Miss Evelyn Alice Johnson of Minneapolis, August 12.

EUGENE YOUNG, Champaign, Ill., to Miss Madge Myers of Mansfield, August 31.

Personals

Dr. Worling R. Young, Geneseo, has accepted a position at Madison, Wis., in the health department of the state university.

The Rock Island County Medical Society was addressed, October 8, by Dr. Aaron Arkin, Chicago, on gastro-intestinal diseases.

Dr. Alexander L. Darche has accepted the po-

sition of assistant physician at the Wyoming State Hospital, Evanston, Wyo.

Dr. Phillip S. Waters, Alton, has been appointed managing officer of the Lincoln State School and Colony to succeed Dr. Christian H. Diehl, resigned.

Dr. Henry L. Davis, Rockford, was elected surgeon general of the United Spanish-American War Veterans at the recent national convention in Denver.

The St. Clair County Medical Society was addressed, October 3, by Dr. Joseph F. Bredeck, St. Louis on "Clinical Application of the Shilling Blood Count."

The Winnebago County Medical Society, Rockford, was addressed, October 8, by Dr. Leroy H. Sloan, Chicago, on "Fundamental Principles in Neurologic Diagnosis."

Dr. William D. McNally addressed the National Association of Coroners at Milwaukee, October 1, on "Diagnosis and Treatment of Gas Asphyxiation in Homes."

Dr. Jacobo Fajardo of the Philippine Islands health department, who is traveling in the United States under the auspices of the Rockefeller Foundation, visited medical institutions in Chicago last month.

Dr. Willis C. Campbell, professor of orthopedic surgery, University of Tennessee College of Medicine, Memphis, addressed the Chicago Society of Industrial Medicine and Surgery, October 2, at the Medical and Dental Arts Club on "Low Back Pain."

Dr. William C. Woodward, director, Bureau of Legal Medicine and Legislation of the American Medical Association, addressed the fifty-second annual meeting of the American Bar Association, Memphis, October 22, on "The Office of Coroner in the United States: Its Proposed Abolition."

The Chicago Council of Medical Women was addressed, November 1, at the Medical and Dental Arts Club by Drs. Anna R. Lapham on "Treatment of Pelvic Dystocias," and Florence E. W. Hark on "Treatment of Rachitic Pelvis."

Col. Fielding H. Garrison, U. S. Army Medical Corps, author of the widely known book "An Introduction to the History of Medicine," addressed a joint meeting of the Chicago Surgical Society, the Institute of Medicine and the Society of Medical History at the City Club, October 4.

Dr. Harry B. Levey is reported to have been appointed director of the child guidance clinic recently established by Tulane University of Louisiana School of Medicine, New Orleans. Dr. Levey has since 1926 been connected with the Institute for Juvenile research, Chicago. He is a graduate of Rush Medical College and a former Cook County Hospital intern.

Dr. Richard C. Cabot, Cambridge, Mass., the guest of honor at a dinner given by the Illinois District of the American Association of Hospital Social Workers at the Midland Club, October 11, spoke on "The Value of Medical Social Service to the Hospital and the Community."

Dr. N. S. Davis III spoke on "Hypertension, the Decompensated Heart, and Treatment of Pneumonia" before the post-graduate conference of the Michigan State Medical Society at Benton Harbor on October 16, 1929.

Dr. Henry H. Bishop, Cadiz, Ky., has been appointed health officer of the city of Bloomington, effective October 1, to succeed Dr. George D. Heath, Jr., who resigned several months ago. Before he was health officer of Trigg County, Kentucky, Dr. Bishop was for several years in general practice.

Dr. Walter C. Bisson has been appointed postmaster of Charleston, Ill. Dr. Bisson served with the one hundred and thirty-first infantry of the thirty-third division in France and took part in the Meuse-Argonne campaign and the Somme campaign.

The Chicago Medical Society will give a series of public lectures on the second Wednesday in each month except January, when the lecture will be on the third Wednesday. The public lecture, October 9, at the Medical and Dental Arts Clubs by Paul H. Douglas, Ph.D., professor of industrial relations at the University of Chicago, on "Some Economic Problems of the Medical Profession as Seen by an Economist."

Dr. Fred L. Adair, professor of gynecology and obstetrics, University of Minnesota Medical School, Minneapolis, has accepted the chair of gynecology and obstetrics at the University of Chicago Medical School. Previous to his de-

parture from Minnesota, Dr. Adair was guest of honor at a number of dinners given by his associates. He is a graduate of Rush Medical College, has done graduate work in Europe, was in general practice for several years before specializing and since 1905 has been on the faculty of the University of Minnesota. He served in the World War, is a past president of the Hennepin County Medical Society, is secretary of the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association, and the author of many articles in medical journals concerning his specialty. His appointment marks the opening of this department at the south side school.

Dr. Louis Radcliffe Grote, head physician of the von Noorden Clinic in Frankfort- am- Main, Germany, on invitation of various medical organizations, is visiting this country, where he will discuss the latest findings of the clinic on diabetes and other disorders of metabolism.

Dr. Thos. W. Bath, of Reno, Nevada, formerly of Bloomington, Ill., has been appointed surgeon general with rank of colonel on the staff of Governor Balzar of Nevada.

Mrs. O. F. Wilson of Waynesville, Ill., writes that the late Dr. Wilson was in active practice there until February of this year. He retired at that time on account of ill health, leaving a good opening for a physician. Inquiries about the prospects for practice in that district may be directed to Mrs. Wilson.

Dr. Alton S. Pope, epidemiologist and chief of the bureau of communicable diseases in the Chicago Department of Health since December, 1926, has resigned to become epidemiologist on tuberculosis for the Massachusetts state department of health and will also join the faculty of the school of public health in Boston.

News Notes

—The Chicago Medical Society was addressed, October 23, by Dr. Abraham Levinson on hemorrhage of the new-born and Dr. Edward H. Ochsner on fractures of the hip.

—The educational committee of the Chicago Medical Society in five days in September received twenty requests from principals of high schools for physicians to talk before student assemblies.

—St. Elizabeth's Hospital on North Claremont Avenue has undertaken the construction of an eleven story addition and later will add to it two wings.

—The women physicians of Chicago gave a banquet to visiting fellows of the American College of Surgeons at the Chicago Women's Club, October 16, following a reception.

—Twenty new cases of smallpox were reported in Rock Island, September 30, eleven of which were among pupils in the Eugene Fields School. The total number of cases then was said to be thirty.

—The Chicago Ophthalmological Society and the Chicago Laryngological and Otological Society gave a dinner to the visiting members of the American College of Surgeons, October 16, at the Stevens Hotel.

—The Institute of Medicine of Chicago and the Society of Internal Medicine of Chicago were addressed, October 25, at the City Club by Dr. Walter B. Cannon, George Higginson, professor of physiology, Harvard University Medical School, on "Function of the Sympathetic System in Maintaining the Stability of the Organism."

—At the Illinois Conference on Public Welfare, Evanston, October 28-31, among others, Dr. Lewis J. Pollock, professor of neurology, Northwestern University Medical School, spoke on "Psychiatric Factors in Convalescence," and Michael Davis, Ph.D., of the Julius Rosenwald Foundation on "Health and Social Work."

—The Illinois Conference of Health Officers met jointly with the Illinois Municipal League at Springfield, October 17-18. Among others, Dr. John D. Nichols, director of health at Mooseheart, spoke on "Ten Years' Experience With Toxin-Antitoxin"; Thomas G. Hull, Ph.D., of the state health department on "Undulant Fever," and Dr. Andy Hall, the state health commissioner, on "The State Health Program."

—An organization, known as the American Association of Obstetricians, Gynecologists and Abdominal Surgeons Foundation, has been formed for the study of maternal mortality and methods of reduction. It will work through

women's clubs, health groups and parent-teacher organizations and will also urge upon medical schools the more adequate teaching of obstetrics.

—The Illinois Tuberculosis and Public Health Association held a one day meeting at Joliet on Tuesday, October 29.

Drs. F. O. Frederickson, Dr. M. L. Harris, Carroll Eugene Cook, R. H. Hayes and C. A. Hedblom of Chicago took part in the program.

—The Chicago Medical Society and the Chicago Urological Society held a joint memorial meeting, October 24, for the late Dr. William T. Belfield, at which the first annual William T. Belfield lecture was delivered by Dr. Gustav Kolischer. This lecture had been planned by the urological society before Dr. Belfield's last illness and it had been hoped that he would be able to attend the first lecture.

—So many foci of malaria have developed in the central counties of Illinois in the last few months that a greater prevalence may be expected next year, the state health department says, unless control measures are adopted. Madison County reported fifteen cases; Macon, eight, and Sangamon, four; and twelve other counties in the central part of the state reported nineteen cases, making a wide area in which the mosquitos have become infected. It is said that the contact with the South by automobile has provided ample opportunity to bring the disease back into Illinois. This state has been singularly free from malaria for some time, but the disease once was a veritable plague.

—The Fifty-second Annual Meeting and Dinner of the Chicago Gynecological Society in conjunction with the Chicago Medical Society in honor of Dr. Charles B. Reed was held at the Medical and Dental Arts Club, October 11, 1929.

Following the annual election of officers, the following speakers took part in the program: Drs. W. A. Evans, James H. Hutton, Irving S. Cutter, Pliny R. Blodgett and Mr. Payson S. Wild.

Deaths

William Thomas Belfield, Chicago; Rush Medical College, Chicago, 1877; a Fellow, A. M. A.; chairman of the Section on Genito-Urinary Diseases of the American Medical Association, 1911-1912; emeritus professor of genito-urinary surgery at his alma mater; past president of the Chicago Medical Society, the Chicago Institute of Medicine, the American Association of Genito-Urinary Surgeons, the Chicago Urological Society and the American Urological Association; member of the American College of Surgeons; on the staffs of the Henrotin, Presbyterian and Cook County hospitals; pioneer in suprapubic prostatectomy; originated the treatment of seminal vesicle infections and radiography of the vesicle by way of the vas deferens; for many years a medical leader in the Middle West; aged 73; died, October 4, of acute dilatation of the heart and chronic myocarditis.

Charles Clifford Bell, Bushnell, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1898; died from accidental injuries on the Burlington Railroad track at Avon, September 26.

John William Bowling, Shawneetown, Ill.; College of Physicians and Surgeons, 1877; a Fellow, A. M. A.; president of the Gallatin County Medical Society; aged 67; died, September 13, of tuberculosis.

Henry James Caldwell, Wyanet, Ill.; Trinity Medical College, Toronto, Ont., Canada, 1885; aged 73; died, September 19, of myocarditis.

James Welch Guest, Chicago; Bellevue Hospital Medical College, New York, 1888; a Fellow, A. M. A.; aged 61; died, September 1, of toxemia and debility due to Hodgkin's disease.

Matlock V. Gunn, Bloomington, Ill.; Medical College of Ohio, 1885; a practitioner for many years in El Paso and Bloomington; aged 69; died, October 1, following an operation in University of Pennsylvania hospital in Philadelphia.

William F. Holmes, Stewardson, Ill.; Rush Medical College, 1897; a practitioner in Stewardson over 25 years and founder of the hospital there, aged 62; died, September 26, after a long illness.

Hero Kruse, Peoria, Ill.; Universität Heidelberg Medizinische Facultät (Badische Ruprecht-Karls Universität) Heidelberg, Baden, 1866; aged 87; died, September 24, of heart disease.

Orville W. MacKellar, Chicago; Iowa State University, College of Medicine, 1887; a member of surgical staff of Cook County hospital for nine years; at times also on staff of Mary Thompson, Jackson Park and Washington Park hospitals; a Fellow, A. M. A.; aged 65; died in Kingsville, Tex., while on an automobile trip through that state.

William Schoenneshoefer, Streator, Ill.; Rush Medical College, 1888; a Fellow, A. M. A.; a practitioner in Lostant and Streator for many years; served in the World War as Captain M. C.; aged 61; died, September 28, of myocarditis, nephritis and arteriosclerosis.

John Charles Stamm, Chicago; Rush Medical College, Chicago, 1889; a Fellow, A. M. A.; aged 60; died, September 2, at St. Joseph's Hospital, of angina pectoris.